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ASSESSING EXPORT PERFORMANCE OF INDIA IN LIVESTOCK SECTOR

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India is known for its livestock wealth and ranks high among the nations having bovine population. However, despite having huge livestock population, India stands insignificant in the world trade of livestock products. The recent concerted efforts made by the government in the era of liberalization after opening up of the national economy to the international market have certainly boosted India's export trade of livestock products to newer heights. The dairy industry of India is already at a take-off stage and the entry of the corporate sector following the liberalized policies of government is bound to complement the efforts of National Dairy Development Board (NDDB) to usher in a white revolution. The most important achievement of the dairy industry is the near-self sufficiency in milk production. Nonetheless, the possibility of India emerging as a potential exporter of various livestock products will largely depend on India's own ability to exploit her potential in this sector and generate exportable surplus of these commodities, aside her competitive strength in the world market.

Introduction:

The livestock has been well knit with the socio-economic fabric of our rural economy and played an important role in the employment and income generation. The developed countries of the world have already well recognized the importance of livestock for employment and income generation and have devolved around their agriculture a prosperous, progressive and forward looking livestock enterprise. The major components through which livestock contributes to the agricultural income are milk and milk products, meat and eggs. These products contribute about one-sixth of the calories and one-third of the proteins in the per capita food supplies of the world; the balance comes from vegetable products (Sarma and Patrick, 1985). The per capita consumption of livestock products is, however, four to five times higher in the developed countries than in the developing countries. In the developing countries, the income elasticity of demand for livestock products is high as compared to cereals. It is also high as compared to the developed economies. This implies that with rising per capita income, the demand for these products would rise faster in the Third World countries.

Although India has huge livestock population, in terms of trade it stands insignificant in the world trade of livestock products. However, it is to be noted that India has tremendous potential to produce and export various livestock products. The high potential of the domestic

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market coupled with marketing opportunities abroad due to the GATT provisions now render India to an enviable position to cater to the huge global market of livestock products, particularly dairy products. Earlier, the past trends in milk production and domestic consumption had indicated a possible exportable surplus of a modest level of 1,00,000 MTs of dairy products by the turn of the century (Baxi, 1994). The emergence of India as an exporting nation of livestock products in the era of liberalization is sure to upset the traditionally exporting block of nations in these products.¹ Further, with the signing of the agreement on Dunkel Draft Report, giving rise to World Trade Organization (WTO) from January 1995, it is believed that the opportunities for enhanced livestock product exports have opened up considerably which our country should take advantage of. It is also widely believed that with the ushering in of the agricultural policy reforms in major industrial countries, the demand for livestock products from developing countries, like India, will get a real boost

Under such a veritable scenario, the relevant question that could strike one is how to exploit India's potential in livestock sector in the current context of liberalization and increasing global integration of economies and of course in view of increasing competition in the world market. There is no denying the fact that the adoption of several liberal policy measures by the Government in more recent times and the application of scientific production techniques have boosted India's livestock production. However, the point that merits consideration is how did the structure of livestock production and exports of India changed over time and what future prospects India holds in the export trade of livestock products in the light of the rapidly changing world market conditions and in view of the various trade policy measures adopted by the various developed and developing nations.

It is on this background that it was thought prudent to evaluate the output and export performance of India vis-à-vis Asia and World in terms of livestock products over the past decade and a half. The dynamics of temporal variations in the structure of production and export trade of livestock products of India is the main foci of the subject matter of this study.

Data Base and Scope of the Study:

The data used in this study were collected from various secondary sources. Time series data for fifteen years (1982-96) on production (in quantity terms) and exports (quantity as well as in value terms) of various livestock products for the world, Asia and India were collected from various issues of the annual publication of Food and Agricultural Organization

¹ The new policy environment is designed to create a favorable climate for livestock output to increase. Effective exchange rate adjustment and trade reforms are expected to improve the terms of trade of tradable livestock products, making it internationally competitive and enable it to record a large increase in export output.

(FAO) of the United Nations, “Production Yearbook”, “Trade Yearbook”, FAO; International Trade Statistics Yearbook, Volume II Trade by Commodity; and FAO Commodity Review and Outlook.

The major foci of attention of this paper are on evaluating the growth performance of India in production and export trade of livestock products, besides analyzing changing structure of India in Asia and World production export trade of such products. The paper also examines structural changes in different species of livestock population over time not only for India but also for Asia and World. In broader terms, the changes studied in this paper related to variations in: (a) pattern of production and export trade of livestock and livestock products, (b) share of export trade in total production, (c) growth in individual livestock commodities produced and exported, and (d) India’s share in Asia and World production and trade of livestock products and underlying growth trends in the same. The reference period for the analysis is from 1982 to 1996.²

The study is divided into two sections. The first section examines the changing structure in the production and export trade of livestock products of India and the changes that have taken place over time in terms of her share in Asia and World in production and exports of these products. The second section evaluates the future prospects of India in the export trade of various livestock products. The second section also includes concluding remarks.

Section – I

Livestock Production in India:

At present, India accounts for about one sixth of the world’s cattle and half of the world’s buffalo population. The importance of livestock sector in India can be better indicated by looking at its share in agricultural production. The gross value of output from this sector at current prices was estimated at Rs.1,11,372 crores during 1997-98 as compared to Rs.42,040 crores in 1990-91, showing thereby 165 per cent rise in value of output from livestock sector during this period (Government of India, 1999). The importance of livestock sector in India can also be corroborated from the fact that while the share of agriculture in India’s GDP had been declining in more recent times, there was an increasing trend in value of output from livestock sector (Government of India, 1998). In fact, the dairy sector alone accounts for nearly two third of the value of the animal husbandry output. In the light of these facts and in view of designing appropriate policies for giving further boost to their contribution to the national economy and for the overall development of the livestock sector, it is extremely

² In this study the total period of 15 years (1982-96) has been split into three sub-periods. The period 1 is the average of three years from 1982 to 1984 representing the situation at the beginning of the study. The average of triennium ending 1990 is considered as period 2, which represents the situation just before the liberalization. The period 3 is the average of 1994-1996 period and represents the post liberalization scenario

essential to bring into focus the nature and extent of changes that have taken place in the structure of livestock production and in its population dynamics over time.

The scenario obtaining over the last several years have clearly shown a significant shift not only in population dynamics of livestock but also in the production profile of livestock products in India. Table 1 provides an insight into India's changing structure of livestock population production since the early 1980s.

Changing Livestock Population:

As can be discernible from Table 1, the population figures of various species of livestock taken into consideration in this study have gone up considerably over the past decade and a half. The population of cattle in the country is seen to have increased from 182 million nos. during the early eighties to 195 million nos. by the mid-nineties. Similarly, the buffalo population in India has increased from 65 million nos. during the early eighties to nearly 80 million nos. by the mid-nineties. During the given period of time, the overall increases in the population of pigs, sheep, goats and poultry birds are seen to be much higher than the increases in cattle and buffalo population. However, it is to be noted that the major increase in various species of livestock population took place during the period between early - and the late eighties and thereafter a considerable slowing down in the same was noticed. In fact, sheep population had rather declined during the period between late eighties and the mid-nineties. Similarly, a marginal decline in cattle population was also noticed during this period. Nonetheless, the period gone by was marked with significant increases in the population of majority of the species of the livestock in India.

Meat Production:

India has also been showing a continuous increase in its total meat production. This is mainly because of considerable rise in non-vegetarian population over time. In India, various species of livestock such as cattle buffalo, sheep and goats, pigs and poultry birds are used for meat production.³ The production of poultry meat is also gaining considerable ground in India. As can be noticed from Table 1, the total meat production in India has increased by more than four folds over the last one and a half decades with an annual compound growth rate of about 14 per cent during this period. The total meat production in the country was estimated at around one million tonnes during the early eighties, which rose to nearly two million tonnes by the late eighties and over four million tonnes by the mid-nineties (Table 1). The two main categories of meat consumed in largest quantity in India are the goat and poultry meat. In fact, the population of goat and poultry birds in the country has increased at

³ In India, while cattle and buffalo are grown for producing milk and milk products, other species of livestock like pig, sheep, goat, and poultry birds are reared for meat production. The slaughter rates in relation to the population of the animals are: 1.45 per cent for cattle, 3.45 per cent for buffalo, 32.5 per cent for sheep, 35.58 per cent for goats, and 26.25 per cent for pigs (Singhal, 1995).

much faster rate than the population of other species of livestock used for meat production. It is to be noted that about 40 per cent of the goats are slaughtered every year to meet the domestic requirements of meat.

In India, meat is made available through about 3000 registered slaughter houses. In this context, it is to be noted that a centrally sponsored scheme “Assistance to states for (a) Improvement/Modernization of Abattoirs and (b) Establishment of Carcass By-products Utilization Centers and Primary Hide Flying Units” is being implemented. The objectives of the scheme are to provide wholesome and hygienic meat, gainful utilization of animal by-products, prevention of environmental pollution and prevention of cruelty to animals. During the Eighth Plan period (1992-97) and the first year of the Ninth Plan (1997-98), a financial grant of Rs.2,066.09 lakhs was earmarked for the modernization of slaughter-houses in the 14 major states of India (Ministry of Information and Broadcasting, 1999).

Production of Milk and Milk Products:

As for the dairy production front, the total milk production in India has increased from 38.8 million tonnes during the early eighties to 64.8 million tonnes by the mid-nineties (Table 1). During this period, the goat milk production has increased at much faster rate as compared to cow and buffalo milk production. Nonetheless, it is to be noted that the contribution of bovine in India’s total milk production is as high as 97 per cent. Of late, the demand for milk and milk products in India is on the rise. The domestic market for butter, *ghee*, cheese, dairy whiteners and ice cream is also growing at a healthy rate of over 10 per cent per annum. The lower growth rates are observed in whole milk powder and skimmed milk powder (Baxi, 1994). As for the production, the growth in evaporated condensed milk is seen to be lower than the growth in butter and *ghee* production during the given period of time (Table 1).

Share of India in Asia and World Output of Livestock Products:

The scenario obtaining over the past one and a half decades in term of share of India in Asia and in the World output of various livestock products reveals a considerable rise in country’s share not only in Asia but also in the World, particularly in the production of meat and also in certain milk products (Table 2). In fact, the increase in India’s share in Asia and World output of various livestock products like pig, goat and poultry meat, mutton and lamb, cow, buffalo and goat milk, etc. is noticed, particularly during the period between early- and the late eighties and thereafter its share in total Asia and World production of these products has declined marginally. Nonetheless, there has been steady increase in India’s share in Asia and World production of goat milk, butter and *ghee* and also to some extent in pig and poultry meat. A steady increase in India’s share in total Asia and World population of buffalo, pig and poultry birds is also noticed during the study period. Interestingly, while India’s share in

World output of majority of livestock products has been steadily increasing, there has also been cases of declining share of India in Asia's total output of livestock products such as evaporated condensed milk, buffalo milk and wool. Thus, India's share in Asia and World output of various livestock products has fluctuated considerably over the past one and half decades.

Live Animals and Livestock Product Exports of India:

Exports of various livestock products have been given due priority in various trade related policies that were initiated by the Government of India during the era of liberalization and opening up of the national economy to the international market. In fact, the Department of Animal Husbandry and Dairying has formulated a proposals of Rs. 1677.88 crores for the Ninth Plan (1997-2002) for the rapid growth of the livestock sector. The major thrust would be on genetic upgradation of livestock to improve the productivity and production of major livestock products. To achieve these objectives, emphasis would be laid on development of requisite infrastructure, feed management, and better health services (Government of India, 1999). A provision of financial assistance to the tune of Rs.465.69 lakhs has also been made under the central sector scheme "Development of Infrastructure and Technology for Export – Oriented Livestock Product Units" during the Eighth Plan period. The assistance would be provided to one unit each in Utter Pradesh and Punjab (Ministry of Information and Broadcasting, 1999).

The above concerted efforts made by the government in more recent times have certainly boosted the Country's exports of various livestock products to newer heights. The export trade of India in meat and meat products and also in respect of milk and milk products has gone up considerably, both in quantity and in value terms (Table 3). This held especially true after the late eighties period. However, the overall increase in export trade of various livestock products from India is found to be much higher in quantity terms than the value terms. As regards the export of live animals from India, a steady decline is noticed during the study period. The decline in export value of live animals is found to be much sharper than decline in numerical strength of live animals exported from India. The possible reason for this could be attributed to declining world export prices of live animals, particularly after the late eighties period.

Meat and meat product exports from India is seen to be 4-5 per cent of their total production over the past decade and a half (Appendix 1). Though India had produced an annual average of about 0.98 million tonnes of meat during the early eighties, only 45,233 tonnes of this was exported annually in the international market, and this constituted about 4.62 per cent of the annual average production of meat during this period (Table 3 and Appendix 1). During the mid-nineties, India exported 1,55,543 tonnes of meat which

constituted about 3.60 per cent of the annual average production of meat during this period. Thus, despite the fact that in absolute term the quantity of meat exported from India had increased significantly, the exports of the same as proportion of production declined considerably during the given period of time.⁴ The reason for this could be the rise in consumption of meat in domestic market. However, one of the major obstacles in the growth of domestic market for meat products in India is the religious sentiments in the large sections of population which prohibits the consumption of the beef and pork.

As regards milk and milk products, a real boost in their exports from India is noticed only after the early nineties period i.e. in the era of liberalization . While India exported about 364 metric tonnes of dry milk during the late eighties, her exports of the same increased to as high as 4,983 metric tonnes by the mid-nineties. Similarly, the condensed milk exports of India also increased from 29 metric tonnes during the late eighties to 145 metric tonnes by the mid- nineties. Further, it is to be noted that India had been exporting small quantities of *ghee* and butter despite domestic shortage and consequent high prices in the past. The trend over the past one and a half decades reveals a steady increase in India's export of butter and *ghee* (Table 3). Even the export of butter as proportion of its production has also gone up in due course of time (Appendix 1). As regards exports of cheese and curd and also wool, there has been considerable fluctuations in their exports from India over the past decade or so, not only in absolute terms but also in terms of their share in total production.

In fact, in due course of time the status of India has changed from a net importer of livestock products to a surplus nation with high export potential. The increasing export trade of India in various livestock products in more recent times is a case in point in this regard. The foregoing observations also indicate an increasing trend in export trade of India in processed livestock products. The livestock products in processed form are, therefore, acquiring larger significance in the rapidly changing market scenario. In a free trade regime, the processed livestock product exports from India may get further momentum as not only the consumer's taste as well as his preference for products in processed form are gradually changing over time but the demand for such products is also increasing in various regions of the world.

As for the export trade of livestock products, there are also many issues that require fuller attention and discussion. For instance, is our livestock sector protected, what is its comparative advantage, what is its export potential, what are the tariff and non-tariff barriers to livestock exports, what should be the strategy for promoting export of live animals, livestock products, and livestock based manufacture (Mishra, 1995)? There are several issues

⁴ The major importers of the Indian meat and meat products are West Asian countries and also some of the African countries that mainly include Malaysia, U.A.E., Jordan, Saudi Arabia, Oman, Yemen Republic, Kuwait, Mauritius, Bahrain, etc.

that might loom large on the horizon when one discusses the development of livestock sector in the era of liberalization, globalization and privatization.

India's Share in Asia and World Exports of Livestock Products:

There has been considerable increase in livestock exports of India after the late eighties, chiefly because of liberalization of trade and several trade policy changes coupled with surge in international prices of many livestock based products that gave real boost to Indian livestock exports. The upswing in livestock exports of India in due course of time has also filtered into significant increase in her share not only in Asia but also in World export trade. At the same time, for some of the livestock based commodities and for live animals, the share of India in Asia as well as in the World export trade has come down over time, e.g., bovine, sheep and goats among various live animals, and poultry meat, meat dried, salted and smoked and also canned meat among various meat and meat products. This held true both in quantity and value terms. The changing scenario in terms of India's share in Asia and in the World exports of various livestock products over the past 15 years is presented in Table 4.

There has been steady decline in India's share in total live animal export trade of Asia as well as the world over the past decade and a half. This disquieting trend is noticed particularly in value terms. Nevertheless, share of India in fresh, chilled and frozen meat export is noticed to have grown considerably not only in Asia but in the World too. Among various fresh, chilled and frozen meat, India's export has grown more sharply in the case of fresh sheep meat, both in Asia and in the World trade of the same. This holds true both in quantity and value terms. Among various milk and milk products, dry milk, butter and *ghee* and to some extent condensed and evaporated milk export trade of India have grown significantly, both in Asia and in the World. In fact, the results of this study clearly indicate a marginal presence of India in World trade of majority of the livestock products. It is only in the case of bovine meat and also sheep and goat meat that India has shown a considerable share in the global trade of the same, particularly in quantity terms. In fact, India continues to remain as one of the leading bovine meat exporter not only in Asia but also in the World.

Thus, the past trends show that India has achieved considerable growth in exports in a number of livestock based commodities, specially in the post economic liberalization period, but the estimates also show that such growth trends are not devoid of wide fluctuations which puts a shadow of doubt about its future potential.

Export trade of milk and milk products, in particular, have fluctuated widely over the past decade or so. Such fluctuations were due mainly to the fact that India exported these valued products whenever it had exportable surplus of the same and also when international prices were favorable for these products. At present India is not able to compete with EC and US in export trade of dairy products because milk in these countries is highly subsidized (58

percent and 69 percent, respectively). It is to be noted that the GATT negotiations were for removal of these subsidies. If India intends to capture a major chunk of this market, it will have to make concerted efforts to ensure quality of milk and milk products. With the reduction of subsidies, milk in the EC and US will be more expensive and India will have good chance to capture these markets, which were hitherto denied to it.

Section - II

As for livestock products, there are two important aspects which would largely determine the India's potential to export in the future. The most important aspect on which future export potentiality of India would depend could be traced in the domestic requirement of various livestock based products and their expected production levels in the future. In case India generates sufficient production surpluses of these products after meeting the domestic demand, the residual could be made available for exports, provided international prices remain favorable. The future growth in exports for India will also depend on production deficit realized in various developed and developing nations of the world. In fact, production deficit of other countries would act as engine of export growth for India. Nevertheless, how best India can meet the challenges arising out of growing requirements of other countries due to deficit in their production levels would depend on India's export capabilities and available surpluses for exports. In order to assess India's export capabilities, it is worthwhile to first examine what would be the future scenario of domestic requirement of various livestock products in India.

Demand- Supply Perspective of Livestock Products in India:

Several research workers have provided various estimates of India's demand for milk and meat. As per the estimates reported by Kumar and Mathur (1996), the total domestic demand for milk will be to the tune of 88.6 million tonnes in the year 2000/01, 93.1 million tonnes in 2001/02 and 119.5 million tonnes in 2006/07 (Table 5). The authors have also reported the domestic demand estimates for meat and eggs. As per their estimates, the projected domestic demand for meat and eggs will be 4.4 million tonnes in 2000/01, 4.6 million tonnes in 2001/02 and 6.0 million tonnes in 2006/07. Their demand projections are based on certain assumptions like a five per cent per annum growth in income, a drop in population growth from 1.91 per cent to 1.80 per cent between 1995-2000 and 2000-2010, rate of urbanization consistent with the historical trends in per capita consumption pattern as noticed in the NSS data and inequality in the distribution of expenditure across income groups.

India's economic demand estimates for milk are reported to be slightly higher than the domestic demand. Economic demand estimates reported by Patel (1993) are based on

income elasticity of demand at 1.3 and a 4 per cent growth in GNP. The nutritional requirement of milk is placed even at much higher level as compared to domestic or economic demand (Table 5).

As against the domestic demand, the domestic supply of milk is estimated at 85.20 million tonnes in 2000/01, 89.68 million tonnes in 2001/02 and 115.88 million tonnes in 2006/07. These estimates clearly indicate that a deficit in milk production, as compared to domestic as well as economic demand, will be seen all through the next several years. The estimated deficit in milk production, as compared to domestic demand, will be 3.4 million tonnes in 2000/01, 3.42 million tonnes in 2001/02 and 3.62 million tonnes in 2006/07. As regards meat and eggs, the production levels in 2001/02 and 2006/07 will be just enough to meet the domestic requirement.

The foregoing observations clearly indicate that there will neither be any exportable surplus for milk nor for meat and eggs in the near future. However, mention may be made here that India still has enormous untapped potential in its livestock sector which if tapped in the desired manner and direction can lead us to emerge as the leading producer of milk and meat in the world in the years to come.

Concluding Remarks:

There is no iota of doubt that as a result of application of scientific production techniques and favorable government policies the total livestock production of India has increased to a considerable extent. Nonetheless, the export trade of India in livestock products have been highly fluctuating over time. The opening up of the national economy to the international market in the era of liberalization has certainly boosted country's trade in various livestock products. There is also no denying the fact that the successful GATT negotiations have provided India an opportunity to compete on a more equal footing in the global livestock trade. But, at the same time, it also raises concerns on as to how international prices of livestock products will react to free trade regime. Who will gain and who will lose from the possible outcome of trade liberalization is again central point of discussion. According to Baxi (1994), there would be an upward increase in the international prices of dairy products. The long term implications of this can be :(a) EC would lose markets to the US, New Zealand and Australia, (b) A significant rise in cheese export prices, (c) Effect on SMP and Butter prices would be marginal, and (d) The benefit to India through SMP exports would be gradual and modest. One of the arguments put forward by Baxi (1994) is that India will gain from the possible outcome of the changes as the EC will have to raise export prices by 15 per cent to adjust lower inward tariffs. On the whole, India needing a modest share in the world export market for various dairy products will be able to realize better prices in

future. Nevertheless, such realization will be possible only when India produces and exports sufficient quantities of these valued products in the years to come.

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Table 1: Structural Changes in Population and Production Pattern of Livestock Products in India: 1982-1996

Livestock Population / Livestock Products	Triennium Average			% Change			CGR (%)
	Period			2 over 1	3 over 2	3 over 1	
	1	2	3				
A. Population							
Cattle (1000 Head)	181850	197367	194748	8.53	-1.33	7.09	0.35 ^{NS}
Buffalo (1000 Head)	64523	73567	79557	14.02	8.14	23.30	1.57
Pig (1000 Head)	8617	10333	11860	19.92	14.77	37.64	2.74
Sheep (1000 Head)	40820	53253	44905	30.46	-15.68	10.01	0.03 ^{NS}
Goat (1000 Head)	79857	107333	119286	34.41	11.14	49.38	3.14
Poultry birds (10 Lakh)	153	290	585	89.13	102.72	281.52	12.50
B. Meat Production : ('000' MT)							
Pig Meat	92	359	416	288.45	15.99	350.54	15.65
Goat Meat	302	391	478	29.61	22.25	58.45	3.57
Mutton & Lamb	132	157	174	18.39	11.28	31.74	2.35
Poultry Meat	139	278	554	99.76	99.64	298.80	12.90
Meat Total	980	1893	4250	93.16	124.53	333.71	14.49
C. Milk & Milk Products : ('000' MT)							
Cow Milk, Whole, Fresh	17933	24233	32000	35.13	32.05	78.44	5.55
Buffalo Milk	19900	24931	30888	25.28	23.89	55.22	3.90
Goat Milk	952	1502	1945	57.83	29.49	104.38	6.96
Butter & Ghee	723	838	1277	16.03	52.29	76.70	5.33
Evaporated Condensed Milk	343	383	426	11.46	11.41	24.17	1.76
Wool, Greasy	37	35	44	-5.09	24.18	17.86	0.58 ^{NS}
Wool, Scoured	23	24	30	2.45	25.00	28.06	0.64 ^{NS}

Note: 1) Period 1 = 1982-1984; Period 2 = 1988-1990; Period 3 = 1994-1996

2) CGR = Annual Compound Growth Rate (1982-1996)

3) All growth rates significant at 1 per cent level of probability

4) NS = Growth rates not significant at 1 per cent level of probability

Table 2 : Share of India in Asia's and World's Total Output of Various Livestock Products : 1982-1996

Livestock Population / Livestock Products	India's share in Asia			India's share in World		
	Triennium Average			Triennium Average		
	Period			Period		
	1	2	3	1	2	3
A. Population						
Cattle (1000 Head)	49.09	50.64	44.02	14.40	15.53	14.86
Buffalo (1000 Head)	52.91	54.80	54.60	51.30	53.04	52.91
Pig (1000 Head)	2.37	2.46	2.32	1.11	1.22	1.31
Sheep (1000 Head)	12.49	16.00	11.03	3.60	4.53	4.18
Goat (1000 Head)	30.73	34.83	29.05	17.19	19.87	18.54
Poultry birds (10 Lakh)	5.86	6.76	9.33	2.16	2.79	4.62
B. Meat Production : ('000' MT)						
Pig Meat	0.51	1.31	0.95	0.17	0.53	0.50
Goat Meat	25.77	25.64	19.83	15.22	16.42	14.37
Mutton & Lamb	7.63	8.26	5.78	2.17	2.33	2.42
Poultry Meat	2.44	3.06	3.05	0.48	0.72	1.01
Meat Total	3.18	4.14	5.28	0.70	1.11	2.05
C. Milk & Milk Products : ('000' MT)						
Cow Milk, Whole, Fresh	44.34	47.34	38.26	4.83	5.15	6.86
Buffalo Milk	67.72	65.80	64.03	64.68	63.50	61.87
Goat Milk	27.32	36.55	34.51	12.90	17.30	19.25
Butter & Ghee	52.42	53.96	57.17	9.59	11.01	19.34
Evaporated Condensed Milk	56.93	51.49	46.11	7.30	8.07	9.22
Wool, Greasy	8.16	6.81	6.18	1.30	1.09	1.69
Wool, Scoured	8.05	8.73	7.24	1.31	1.18	1.80

Note : Period 1 = 1982-1984; Period 2 = 1988-1990; Period 3 = 1994-1996.

Table 3: Structural Changes in Livestock and Livestock Product Exports of India : 1982-1996

Livestock and Livestock Product Exports	Triennium Average			% Change			CGR (%)
	Period			2 over 1	3 over 2	3 over 1	
	1	2	3				
A. Live Animals (Head)	Quantity Terms						
Bovine Animals	44333	28667	38333	-35.34	33.72	-13.53	-0.51 ^{NS}
Sheep & Goats	79000	81667	3847	3.38	-95.29	-95.13	-22.26
Pigs [@]	-	38333	-	-	-100.00	-	-9.23
B. Meat & Meat Products (MT)							
Meat Fresh Chilled Frozen	45233	68100	155543	50.55	128.40	243.87	11.57
Meat Bovine Fresh	32667	56735	145181	73.68	155.89	344.43	13.94
Meat Sheep Fresh	8733	7873	9348	-9.85	18.73	7.04	2.40
Meat Poultry Fresh	-	86	74	-	-13.90	-	-
Pig Meat	-	-	1593	-	-	-	-
Offals Edible Fresh ^{@@}	-	507	70	-	-86.27	-	-29.13
Meat Offals Fresh Nes	3833	-	-	-	-	-	-
Meat Dried salted Sm ^{@@@}	67	108	70	62.00	-34.88	5.50	5.81 ^{NS}
Canned Meat Nes	380	1	381	-99.74	38033.33	-	-
Meat Extracts	130	-	-	-	-	-	-
Meat Prepared and Preserved	250	1	381	-99.60	38033.33	52.53	-
C. Milk & Milk Products (MT)							
Milk Fresh	-	-	1	-	-	-	-
Milk Dry ^{@@}	33	364	4983	993.00	1267.61	14848.00	43.87
Milk condensed + Evaporated	-	29	145	-	406.98	-	-
Butter	210	318	586	51.27	84.47	179.05	-
Cheese & Curd	-	194	2	-	-98.80	-	-
Wool Greasy	-	617	13	-	-97.89	-	-
Wool Degreased	-	2	1	-	-33.33	-	-
A. Live Animals (Head)	Value Terms : '000' US\$A						
Bovine Animals	17500	9000	5467	-48.57	-39.26	-68.76	-7.58
Sheep & Goats	2867	1983	98	-30.81	-95.04	-96.57	-25.47 ^{NS}
Pigs [@]	-	540	-	-	-100.00	-	-7.21
B. Meat & Meat Products (MT)							
Meat Fresh Chilled Frozen	63200	72317	169003	14.43	133.70	167.41	8.58
Meat Bovine Fresh	37333	54883	149300	47.01	172.03	299.91	12.17
Meat Sheep Fresh	15800	16597	18705	5.04	12.70	18.38	3.19 ^{NS}
Meat Poultry Fresh	-	236	69	-	-70.80	-	-
Pig Meat	-	-	2315	-	-	-	-
Offals Edible Fresh ^{@@}	-	598	120	-	-79.99	-	-24.25 ^{NS}
Meat Offals Fresh Nes	10067	-	-	-	-	-	-
Meat Dried salted Sm ^{@@@}	200	124	442	-37.83	255.50	121.00	5.23
Canned Meat Nes	920	3	977	-99.71	36537.50	6.20	-
Meat Extracts	507	-	-	-	-	-	-
Meat Prepared and Preserved	413	3	977	-99.35	36537.50	136.37	-
C. Milk & Milk Products (MT)							
Milk Fresh	-	-	5	-	-	-	-
Milk Dry ^{@@}	67	683	7230	924.50	958.57	10745.00	39.05
Milk condensed + Evaporated	-	52	200	-	287.10	-	-
Butter	627	952	2068	51.91	117.19	229.95	-
Cheese & Curd	-	135	5	-	-96.30	-	-
Wool Greasy	-	4717	141	-	2.98	-	-
Wool Degreased	-	5	7	-	57.14	-	-

Notes: 1) Period 1 = 1982-1984; Period 2 = 1988-1990; Period 3 = 1994-1996

2) Growth Rates: @ = Period 1985-1993; @@ = Period 1988-1996; @@@ = Period 1986-1996

3) All growth rates significant at 1 per cent level of probability

4) NS = Growth rates not significant at 1 per cent level of probability

Table 4: Changing Structure of India's share in Asia and World Exports of Livestock and Livestock Products

(in Per cent)

Livestock and Livestock Product Export	India's Share in Asia			India's Share in World			Asia's Share in World		
	Triennium Average			Triennium Average			Triennium Average		
	Period			Period			Period		
	1	2	3	1	2	3	1	2	3
A. Live Animals (Head)	Quantity Terms								
Bovine Animals	11.43	8.35	11.33	0.59	0.38	0.40	5.18	4.52	3.53
Sheep & Goats	2.26	1.68	0.09	0.40	0.37	0.02	17.68	22.23	18.31
Pigs@	0.00	1.03	0.00	0.00	0.30	0.00	33.95	28.68	27.62
B. Meat & Meat Products									
Meat Fresh Chilled Frozen	9.10	9.10	9.53	0.52	0.61	0.94	5.66	6.68	9.84
Meat Bovine Fresh	39.48	37.33	67.32	0.97	6.00	2.92	2.45	3.55	4.33
Meat Sheep Fresh	2.23	12.80	22.55	1.01	0.93	1.07	45.21	7.24	4.77
Meat Poultry Fresh	0.00	0.03	0.01	0.00	Neg.	Neg.	6.48	10.99	16.06
Pig Meat	0.00	0.00	0.38	0.00	0.00	0.04	8.24	8.67	10.89
Offals Edible Fresh@@	0.00	6.55	0.15	0.00	0.07	0.01	1.34	1.00	3.74
Meat Offals Fresh Nes	7.85	0.00	0.00	2.46	0.00	0.00	31.41	24.62	28.36
Meat Dried salted Sm@@@	1.25	1.45	0.73	0.02	0.03	0.02	1.43	1.99	2.38
Canned Meat Nes	0.39	Neg.	0.17	0.03	Neg.	0.02	8.20	12.63	11.82
Meat Extracts	4.64	0.00	0.00	0.91	0.00	0.00	19.58	30.79	38.91
Meat Prepared and Preserved	0.29	Neg.	0.19	0.02	Neg.	0.03	8.40	13.96	1.43
C. Milk & Milk Products (MT)									
Milk Fresh	0.00	0.00	Neg.	0.00	0.00	Neg.	0.43	4.79	1.51
Milk Dry@@	0.15	0.68	4.90	Neg.	0.01	0.16	0.84	1.89	3.22
Milk condensed + Evaporated	0.00	0.07	0.17	0.00	Neg.	0.02	3.20	5.09	8.97
Butter	1.15	1.27	1.47	0.02	0.02	0.04	1.43	1.64	3.00
Cheese & Curd	0.00	1.89	0.01	0.00	0.01	Neg.	0.54	0.52	0.66
Wool Greasy	0.00	3.06	0.01	0.00	0.07	Neg.	2.29	2.20	10.74
Wool Degreased	0.00	0.01	Neg.	0.00	Neg.	Neg.	7.66	8.38	11.89
A. Live Animals (Head)	Value Terms								
Bovine Animals	16.23	7.80	5.24	0.62	0.23	0.11	3.81	2.90	2.02
Sheep & Goats	0.88	0.47	0.03	0.27	0.17	0.01	30.99	36.47	30.19
Pigs@	0.00	0.17	0.00	0.00	0.04	0.00	24.78	23.69	25.39
B. Meat & Meat Products (MT)									
Meat Fresh Chilled Frozen	7.08	4.28	4.46	0.40	0.28	0.44	5.70	6.51	9.96
Meat Bovine Fresh	31.45	24.14	56.08	0.50	0.44	1.32	1.58	1.84	2.35
Meat Sheep Fresh	8.69	15.42	23.40	1.11	1.00	0.89	12.82	6.48	3.82
Meat Poultry Fresh	0.00	0.05	Neg.	0.00	0.01	Neg.	8.16	13.10	18.11
Pig Meat	0.00	0.00	0.13	0.00	0.00	0.02	9.46	12.06	16.98
Offals Edible Fresh @@	0.00	6.23	0.21	0.00	0.06	0.01	1.84	0.93	3.42
Meat Offals Fresh Nes	11.47	0.00	0.00	2.74	0.00	0.00	23.93	17.85	18.62
Meat Dried salted Sm@@@	1.36	0.53	1.61	0.02	0.01	0.03	1.69	1.72	1.68
Canned Meat Nes	0.56	Neg.	0.17	0.04	Neg.	0.02	6.26	9.35	9.93
Meat Extracts	2.88	0.00	0.00	0.75	0.00	0.00	26.18	31.09	45.51
Meat Prepared and Preserved	0.32	Neg.	0.19	0.02	Neg.	0.02	5.82	10.43	11.84
C. Milk & Milk Products (MT)									
Milk Fresh	0.00	0.00	0.01	0.00	0.00	Neg.	1.00	2.41	2.87
Milk Dry @@	0.16	0.61	2.68	Neg.	0.01	0.10	1.38	2.03	3.91
Milk condensed + Evaporated	0.00	0.14	0.21	0.00	0.01	0.02	2.78	3.75	8.18
Butter	2.09	2.11	2.63	0.02	0.03	0.06	0.99	1.27	2.16
Cheese & Curd	0.00	0.52	0.01	0.00	0.00	Neg.	0.54	0.37	0.46
Wool Greasy	0.00	10.61	0.12	0.00	0.11	0.01	2.36	1.06	5.20
Wool Degreased	0.00	Neg.	Neg.	0.00	Neg.	Neg.	7.56	7.82	10.14

Note: Neg. – Negligible

Table 5 : Demand – Supply Perspective of Livestock Products in India
(million tonnes)

Particulars	2000-01	2001-02	2006-07
I. Milk			
(i) Domestic Demand ^a	88.60	93.10	119.50
(ii) Economic Demand ^b	90.14	-	-
(iii) Nutritional Requirement ^b	89.12	-	-
(iv) Milk Production ^c	85.20	89.68	115.88
(v) Difference [(iv) – (i)]	-3.40	-3.42	-3.62
II. Meat and Eggs			
(i) Domestic Demand ^a	4.40	4.60	6.00
(ii) Target Production ^a	-	4.60	6.00

Notes: a – domestic demand estimates provided by Kumar and Mathur, 1996
b – economic demand and nutritional requirement estimates provided by Patel, 1993
c – present study estimates of production

Appendix 1 : Changing Structure of India's Livestock Exports as Proportion of its Livestock Production

(in per cent)

Live Animals/ Livestock Products	Triennium Average		
	Period		
	1	2	3
Bovine Animals	0.02	0.01	0.01
Sheep and Goat	0.07	0.05	0.01
Pigs	-	0.37	-
Meat and Meat Products	4.62	3.6	3.66
Butter and Ghee	0.03	0.04	0.05
Wool Greasy	-	1.74	0.03
Wool Degreased	-	0.01	0.01

Note: Period 1 = 1982 – 1984 ; Period 2 = 1988 – 1990 ; Period 3 = 1994-1996



