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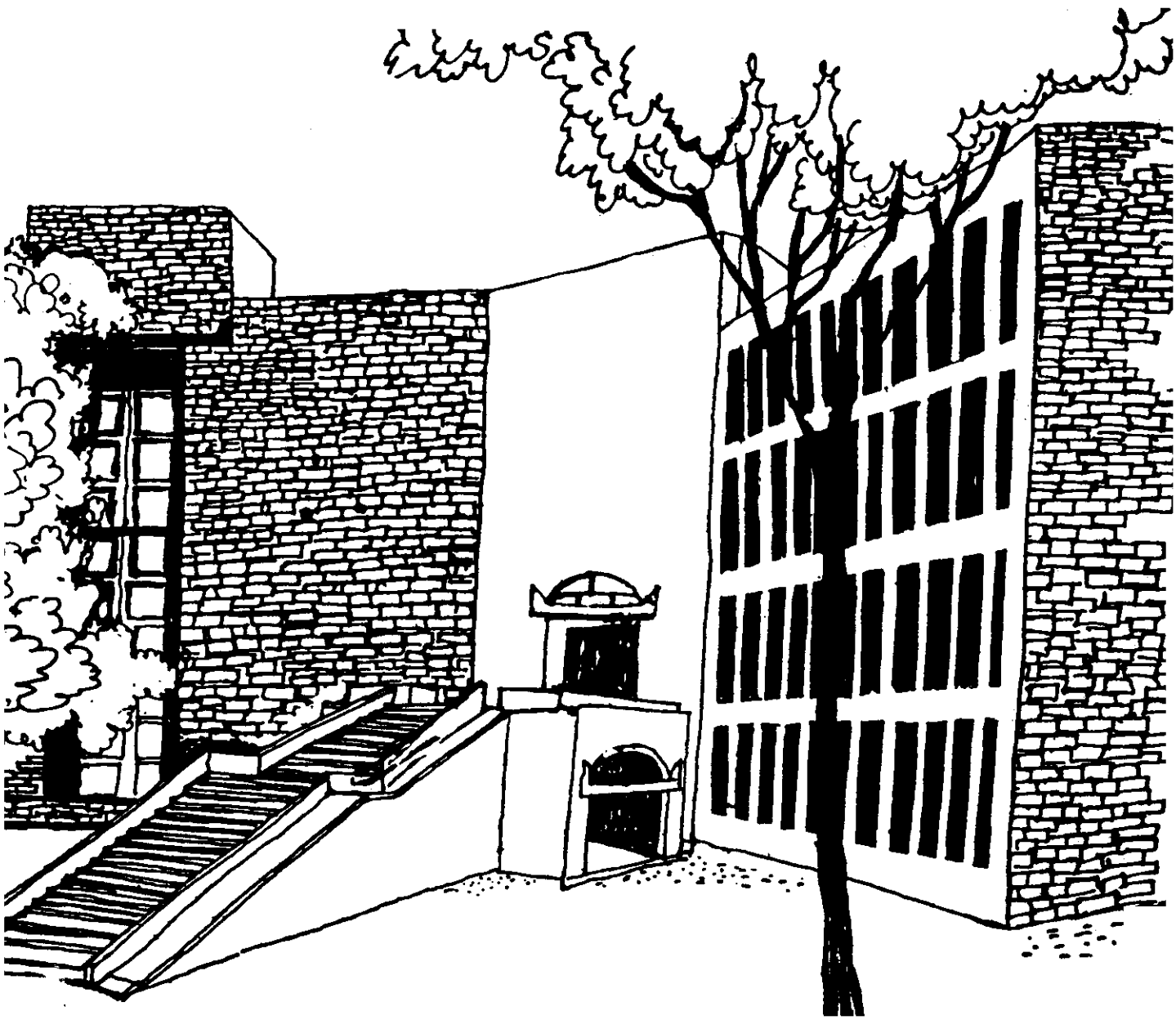

INDIAN OILMEALS/CAKES SCENARIO, 1961-90

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INDIAN OILMEALS/CAKES SCENARIO, 1961-90

Introduction

Oilseeds holds a key position in the Indian economy and contributed 4% of India's GDP, and 10% of value of all agricultural commodities during the period 1981-85 (Chandhok and The Policy Group, 1990). India is one of the largest oilseed producing country with 7% share in the global production, on an average, during the period 1986-90 (Oil World, 1991). Oilseeds considered in the study are: soybean, cottonseed, groundnut, sunflower, rapeseed and mustard, sesamum, copra, and linseed. These seeds have long been crushed for their oil and meal/cake. Cake is that portion of oilseed after oil has been expelled mechanically, whereas meal is the portion of oilseed after solvent extraction of oil (UNO, 1984). However, these two terms are used interchangeably in this study. As cattle feed, oilmeals are more nutritive and readily digestible. As such, they have no substitutes. Milch animals with high performance can only be maintained at peak production by feeding high quality oilmeals, over and above the green fodder. These feeds provide metabolic energy (in calories), proteins, and other nutrients and the nutrient composition vary from feed to feed (Sarma, 1986). Given the importance of oilmeals in the livestock industry, an attempt is made here to review the trends in consumption, production, and trade aspects of oilmeals in India during 1961-90.

Consumption

Feed is of paramount importance for economic milk production. However, overall feed deficiency is estimated to be 30% in respect of total digestible nutrients. It is as high as 70% in respect of digestible crude protein. Apart from green fodder and dry fodder, by-products obtained from grain processing (brans), oilseed processing (meals and cakes), and pulses processing (chunni) are the major feed ingredients fed to Indian livestock. According to one estimate, brans are the main source accounting for 47% in 1970, and 38% in 1988 of the total concentrates produced in the country. As of oilmeals, it was 31 and 28% respectively for the same period (Reddy, 1988).

In the light of the above facts an attempt is made to review the trends in composition of oilmeals in consumption/domestic disappearance. Disappearance has been calculated as the residual of balance from opening stocks plus production minus exports and ending stocks. Practically there have been no imports of oilmeals into India. Figure 1 presents relative shares of these oilmeals during 1961-65, 71-75, 81-85, and 86-90. It is very clear from the Figure that cotton, groundnut, and rapeseed are the three major oilmeals available for consumption in India. Soybean and sunflower cakes started entering into oilmeals market only from mid eighties. Disappearance of different oilmeals for selected periods are presented in Table 1.

Total domestic disappearance of oilmeals stood at 3252 thousand tonnes during the 1961-65 period, and it went upto 5878

thousand tonnes during 1986-90 period-an increase of 81%. In terms of compound growth rate, it grew at 2.1% per annum during 1961-90. Of the total consumption, cotton, groundnut, and rapeseed, together accounted for about 84% and 86% during 1961-65 and 1986-90 periods respectively. While the relative share of rapeseed meal has been increasing that of groundnut declining. Another interesting point that emerges from Table 1 is that soybean and sunflower meals are entering into cattle feed basket, while the relative shares of sesamum, copra, and linseed have declined. Though the domestic disappearance of groundnut meal increased, in absolute terms, its relative share has declined mainly due to increase in the relative share of soybean. During the 1986-90 period, relative shares of cotton, rapeseed, groundnut, soybean, sesamum, linseed, copra, and sunflower oilmeals are respectively 32, 27.5, 26.3, 3.9, 3.4, 3.2, 2.2, and 1.5%. Particularly, soybean with its low oil, high cake content compared with most other oilseeds is becoming as a source of oilmeal in recent years.

Demand for Oilmeals

Demand function analysis was carried out using the time series data, 1961-87, in an attempt to directly assess the relationship between demand for oilmeals and relevant factors. Domestic disappearance demand is considered to be a function of weighted price of oilmeals (WPO), adult bovine stock (ABS), and wholesale price index of milk (WPIM). The demand function is

specified as follows:

$D_t = a_0 + a_1$ (WPO) + a_2(ABS) + a_3(WPIM)

where D_t = Total demand for oilmeals in year t (000 tonnes),

WPO = Weighted price of oilmeals (US$/tonne),

ABS = Adult bovine stock (millions),

WPIM = Wholesale price index of milk (1970/71 = 100), and

a_1, a_2, and a_3 are the respective coefficients.

Linear, semilog, and double-log functions are tried and double-log form turned out to be best fit in terms of signs, level of significance, coefficient multiple determination (R^2), and F-value. Though double-log form has more acceptable assumptions, we are aware of the problems associated with it. Double-log assumes constant elasticites and allows little flexibility to the shape of the demand functions. The selected function is reported here:

$$\underset{}{\text{Log}(D_t)} = \underset{(2.96)}{-8.97} - \underset{(4.76)}{0.2635}^{**} \text{Log (WPO)} + \underset{(5.55)}{3.5745}^{**} \text{Log (ABS)} + \underset{(0.15)}{0.0119} \text{Log(WPIM)}$$

Figures in parentheses are respective t-values.

** Significant at 1% level of significance.

R^2 = 0.88 F-value = 64.3 D-W = 1.8680 N = 1961-87

The estimated elasticity of price, and adult bovine stock are of the expected sign and statistically different from zero at

99% level. Though price elasticity of milk, cross price elasticity, is appearing with right sign it is not significant. Thus price of cakes, and stock are the influential factors in explaining the variation in demand for oilmeals in India.

Production

On the supply side, oilmeals prbduction is a function of cropping pattern and productivity. It is said that oilseeds cultivation is mostly restricted to drylands with no little application of fertilizers, and other improved agronomic practices. Further, there is no appreciable breakthrough in oilseeds breeding programme, except in castor seed. As of cropping pattern, it is highly rigid in the country because of habit formation and other cultural practices. With this background, changes in production of different oilseeds are analysed. A two period comparison is made in Figure 2. Three points are emerging: (a) the share of groundnut is declining and that of rapeseed is increasing; (b) soybean is fast emerging as one of the major oilmeals; and (c) the relative share of cotton is more or less constant. Table 2 presents changes in production of oilmeals during 1961-90.

Oilmeals production has increased from 4046 thousand tonnes during 1961-65 period to 7308 thousand tonnes during 1986-90 period-an increase of 81%. Thus production and consumption are increasing simultaneously with similar growth rate. Again,

groundnut, cotton, and rapeseed accounted for about 86% of the total oilmeals production during 1961-65 period, and 77% during 1986-90. Groundnut meals production has increased from 1683 thousand tonnes to 1877 thousand tonnes during 1961-65 to 1986-90. However, its relative share has declined from 41.6 to 25.7% during the same period. It is mainly due to the emergence of soybean crop. Soybean production started in the mid seventies, and its relative share rose to as much as 13% during 1986-90 period. Similarly, rapeseed meals production accounted for 17% of the total oilmeals during 1961-65 and went up to 26% during 1986-90 period. There is constant decline in the relative shares of sesamum, copra, and linseed.

Exports

Oilmeals are actively traded in both domestic and international markets. During 1961-90, about 20% of oilmeals produced in India are exported, the range being 11 to 33%. These oilmeals are being exported to developed countries of the world, especially to the European Economic Community (Surendra Singh and Kamaljit Singh, 1985). Adequate literature is available for and against the exports of oilmeals, and we are no more interested in confusing the readers on this aspect (Surendra Singh and Kamaljit Singh, 1985; Niar, 1985; Vinod and Achaya, 1980; Achaya and Vinod 1986; and Shanti George, 1987). Changes in the exports of different oilmeals from India are presented in Table 3.

During the 1961-65 period, Indian exports of major oilmeals amounted to 793 thousand tonnes, of which groundnut meal alone accounted for 88%. By 1986-90 period, exports of oilmeals and cakes have grown to 1429 thousand tonnes. For various reasons, exports dipped down to 809 thousand tonnes during 1981-85 period. Further, there is an appreciable change in the relative shares of different oilmeals. Soybean cake entered the international trade during the mid-eighties, and its relative share went up to as much as 48% during 1986-90 period.

Groundnut meal, a major oilmeal exported during 1961-65, has lost her share by as much as 65%-a remarkable decline indeed. The decline in the exports of groundnut meal could be due to the following reasons. Firstly, lower production, particularly in Gujarat. Secondly, incidence of protein in Indian groundnut is sometimes so low that it is difficult to produce and tender meals on the basis of 50% O + A warranty. Thirdly, high aflatoxin content continues to pose a problem. Infact, this has affected the image of Indian groundnut meal in the world market. As it is, world trade in groundnut meals is shrinking mainly on account of stiff competition from soybean meal (Oil World, 1990). East European countries do not seem to be in a position to continue buying from India, whereas free currency area countries are hesitant to turn to India for meeting their protein requirement (The Economic Times, 1991). Of late, rapeseed meal also being exported and her share went upto 19% during 1986-90 period. In terms of current prices, value of these exports increased from

US$0.84 lakh during 1961-65 to US$2.4 lakh during 1986-90. The United Kingdom, the Netherlands, France, Italy and West Germany (now united Germany) are the major importers of Indian oilmeals.

Figure 3 presents the relationship between production of oilmeals and its exports during 1961-89 period. Exports as a percentage of production is the highest, 33% in 1976. However, during the 1978-88 period there is a sharp decline in the proportion of exports, and it again picked up in 1989.

Bovine Economy

So far, with the help of available data, Indian oilmeals system, which consists of consumption, production, and trade, sub-systems are analysed. For want of lack of data, policy and processing sub-systems are not analysed here. Instead, per adult bovine availability of oilmeals are worked out (Table 4) as these feeds accounts for about 20-30% of the total cost of milk production. To this end, two assumptions are made: (a) of the available oilmeals 12% is fed to pigs, poultry, sheep, and goats (Amble, 1965), and (b) no oilmeals were fed to young stock. It is to be mentioned here that there are wide variations in feeding patterns across different categories of animals and hence one is to be cautious in using these estimates. Availability of oilmeals, per adult bovine, worked out to be 153 kg in 1961 and 239 kg per annum in 1987. However, in the year 1977, it dipped to a low of 164 kgs. As of milk production, it increased from 19.4 million tonnes in 1961 to 43.9 million tonnes in 1987-an

increase of 115% or 4.25% per annum during 1961-87. Thus the growth in milk production is twice that of availability of oilmeals. The credit goes to operation flood programme, under which both forward and backward linkages with respect to milk are made.

Summing Up

NCA (1976) has estimated that 5.75 million tonnes of concentrates are needed to bridge the gap between availability and requirement. On the other hand the demand for milk is increasing year after year due to population growth, and rise in per capita income. Hence demand for livestock feeds, for economic milk production will increase. This paper is an attempt to review consumption, production, and trade related aspects of oilmeals in India. Cotton, groundnut, and rapeseed are major cakes in terms of consumption, and production, though there are wide fluctuations in their relative shares. The supply of oilmeals has been increasing from 1981 onwards resulting significant increase in the availability of these feed stuffs. India is a major exporter of oilmeals in the world and on an average, 20% production is being exported to developed economies of the world.

Literature Cited

Achaya, K.T. and Vinod, K. Huria (1986), "Rural Poverty and Operation Flood", **Economic and Political Weekly**, 21(37): 1651-1656.

Amble, V.N. (1965), "Feed Requirements of Bovines and Possibilities of Meeting Them", **Indian Journal of Agricultural Economics**, 20(1): 70-76.

Chandhok, H.L. and The Policy Group (1990), **India Data Base: The Economy**, Volume II, Living Media India Limited, New Delhi.

Gupta, P.R.(ed), **Dairy India** (Various Volumes), Rekha Printers, New Delhi.

Nair, K.N. (1985), "White Revolution in India: Facts and Issues", **Economic and Political Weekly**, 20(25and 26): A89-A95.

Oil World (Various Volumes), **Oilseeds and Oils: Annual Reports**, ISTA, Mielke, Germany.

Reddy, M.R. (1988), Status of Animal Resources in India: Problems and Prospects (Mimeo), Department of Feed and Fodder Technology, Andhra Pradesh Agricultural University, Hyderabad.

Sarma, J.S. (1986), **Cereal Feed Use in the Third World: Past Trends and Projections to 2000**, IFPRI, Washington.

Shanti George (1987), "Stemming Operation Flood: Towards an Alternative Dairy Policy for India", **Economic and Political Weekly**, 22(39): 1654-1663.

Surendra Singh, and Kamaljit Singh (1985), "Impact of Donated Commodities, Export of Feed, and New Technology of Milk Production", **Economic and Political Weekly**, 20(29): 1227-1235.

UNO (1984), **The Vegetable Oils and Fats Industry in Developing Countries: Outlook and Prospectives**, UNO, Rome.

Vinod, K. Huria, and K.T. Achaya (1980), "Dairy Development in India: Some Critical Issues", **Economic and Political Weekly**, 15(45 and 46): 1931-1942.

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Table 1: Domestic Disappearance of Oilmeals in India, 1961-90

Period	Soybean	Cotton	Groundnut	Sunflower	Rapeseed	Sesamum	Copra	Linseed	Total
				.....000 tonnes.....					
1961-65	0.0(0.0)	1041.0(32.0)	985.0(30.3)	0.0(0.0)	699.8(21.5)	189.2(5.8)	103.6(3.2)	233.8(7.2)	3252.4(100)
1966-70	0.0(0.0	972.8(30.8)	917.0(29.0)	0.0(0.0)	787.8(24.9)	187.8(5.9)	106.6(3.4)	188.8(6.0)	3160.8(100)
1971-75	20.6(0.6)	960.6(27.5)	938.8(26.9)	0.2(0.0)	1038.2(29.7)	182.8(5.3)	127.4(3.6)	222.4(6.4)	3491.0(100)
1976-80	97.8(2.7)	1011.4(27.9)	1063.2(29.3)	4.0(0.1)	955.0(26.4)	172.8(4.8)	126.4(3.5)	191.8(5.3)	3623.4(100)
1981-85	182.0(3.7)	1343.8(27.3)	1492.6(30.4)	65.6(1.3)	1268.2(25.8)	221.0(4.5)	128.4(2.6)	214.6(4.4)	4916.2(100)
1986-90	227.8(3.9)	1878.6(32.0)	1545.8(26.3)	87.8(1.5)	1618.4(27.5)	201.0(3.4)	129.0(2.2)	189.6(3.2)	5878.0(100)

Figures in parentheses are percentages of total.

Source: Oil World.

Table 2: Production of Major Oilmeals in India, 1961-90

Period	Soybean	Cotton	Groundnut	Sunflower	Rapeseed	Sesamum	Copra	Linseed	Total
	.....000 tonnes.....								
1961-65	0.0(0.0)	1103.6(27.3)	1683.0(41.6)	0.0(0.0)	699.8(17.3)	189.8(4.7)	121.8(3.0)	247.8(6.1)	4045.8(100)
1966-70	0.0(0.0)	1089.8(27.3)	1591.4(39.9)	0.0(0.0)	787.8(19.8)	194.6(4.9)	116.6(2.9)	204.8(5.2)	3985.0(100)
1971-75	20.6(0.5)	1114.4(25.0)	1703.0(38.1)	0.2(0.0)	1038.2(23.2)	190.0(4.3)	129.2(2.9)	270.4(6.0)	4466.0(100)
1976-80	134.0(2.9)	1190.8(25.6)	1779.8(38.2)	7.2(0.2)	974.8(20.9)	184.8(4.0)	130.2(2.8)	252.6(5.4)	4654.2(100)
1981-85	405.4(7.1)	1491.4(26.0)	1781.8(31.1)	93.8(1.6)	1373.0(24.0)	228.4(4.0)	131.0(2.3)	224.8(3.9)	5729.6(100)
1986-90	926.4(12.7)	1912.6(26.2)	1876.6(25.7)	160.8(2.2)	1884.0(25.8)	219.2(3.0)	129.6(1.7)	198.8(2.7)	7307.6(100)

Figures in parentheses are percentages of total.

Source: Oil World.

Table 3: Exports of Major Oilseeds from India, 1961-90

Period	Soybean	Cotton	Groundnut	Sunflower	Rapeseed	Sesamum	Copra	Linseed	Total
	.....000 tonnes.....								
1961-65	0.0(0.0)	62.6(7.9)	698.0(88.0)	0.0(0.0)	0.0(0.0)	0.6(0.0)	18.2(2.3)	14.0(1.8)	793.4(100)
1966-70	0.0(0.0)	100.8(12.5)	674.4(83.5)	0.0(0.0)	0.0(0.0)	6.8(0.8)	10.0(1.2)	16.0(2.0)	808.0(100)
1971-75	0.0(0.0)	153.8(15.8)	764.2(78.3)	0.0(0.0)	0.0(0.0)	7.2(0.7)	2.4(0.2)	48.8(5.0)	976.4(100)
1976-80	37.4(3.6)	179.4(17.4)	716.6(69.3)	2.6(0.2)	20.0(1.9)	12.0(1.2)	5.0(0.5)	60.8(5.9)	1033.8(100)
1981-85	216.2(26.8)	147.8(18.3)	289.2(35.9)	28.2(3.5)	105.0(13.0)	7.4(0.9)	2.6(0.3)	10.2(1.3)	806.6(100)
1986-90	692.2(48.4)	34.2(2.4)	331.0(23.2)	72.8(5.1)	270.8(18.9)	18.4(1.3)	1.2(0.1)	9.0(0.6)	1429.0(100)

Figures in parentheses are percentages of total.

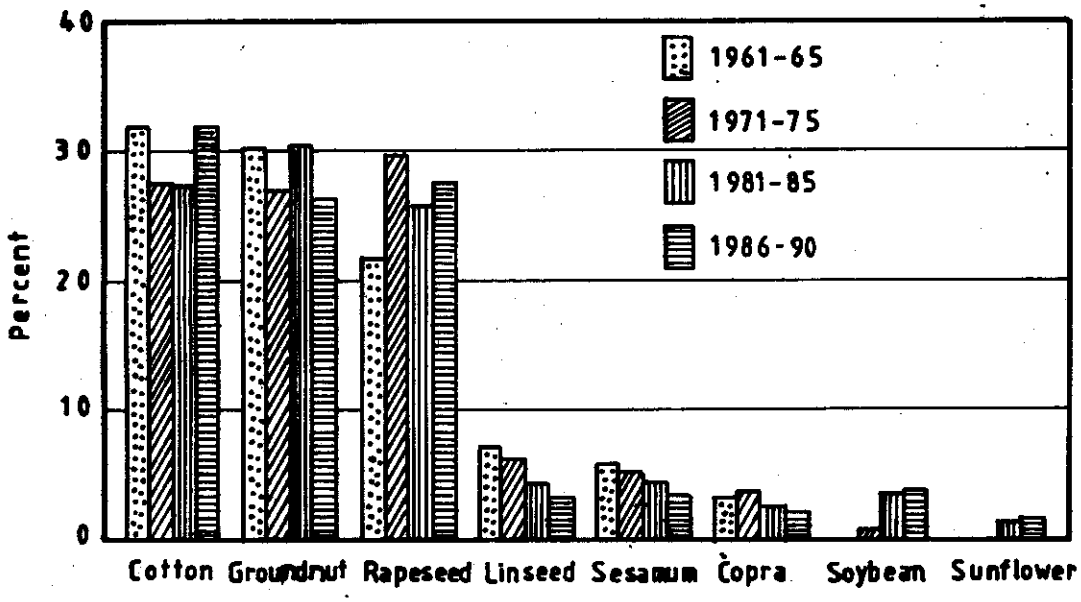
Source: Oil World.

Table 4: Trends in Availability of Oilmeals in India, Selected Periods

Year	Disappearance of oilmeals (000 tonnes)	Adult bovines (millions)	Availability per animal (kgs/annum)	Milk Production (million tonnes)
1961	2445.52	159.50	153.32	20.4
1966	2511.52	163.35	154.70	19.4
1972	3119.60	168.16	185.51	22.5
1977	2829.20	172.75	163.77	28.3
1982	4057.68	188.55	215.20	32.9
1987	4629.68	193.77	238.93	43.9

Source: Dairy India and Oil World.

Figure 1 : Relative Shares of oilmeals in Domestic Disappearance of Selected Periods



Source: Oilworld

Figure 2: Relative Shar
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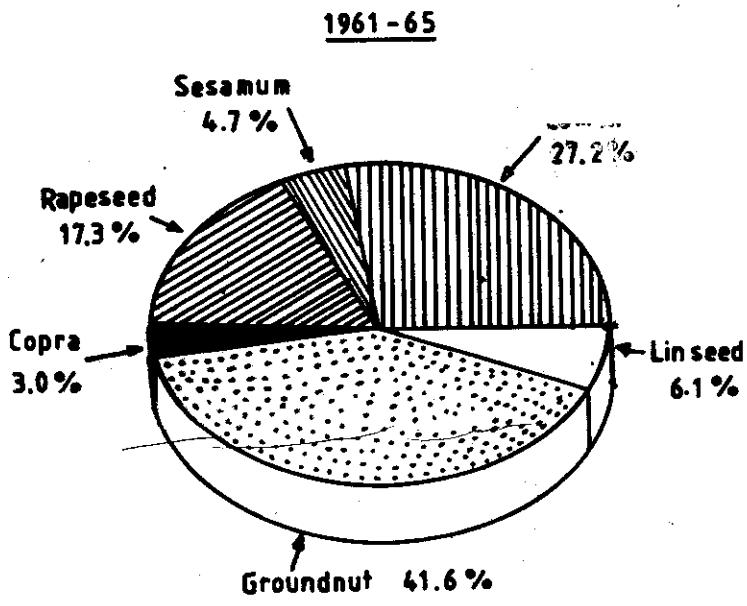

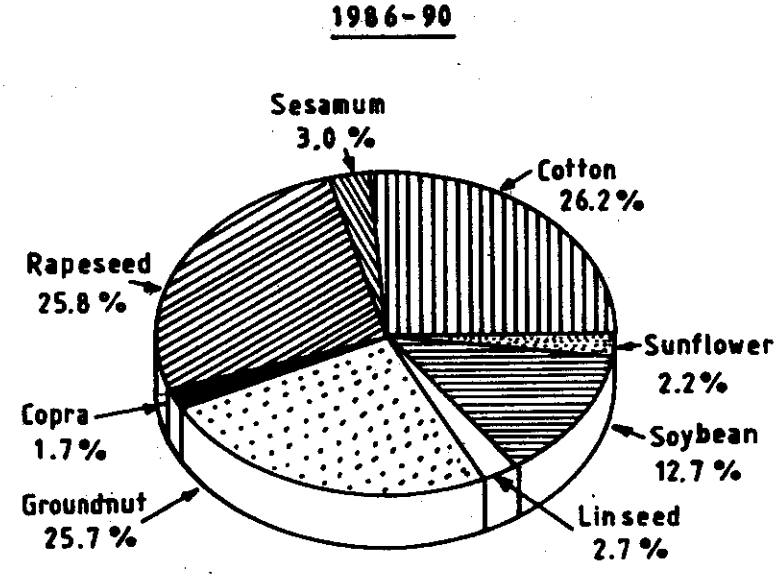

Source: Oil World

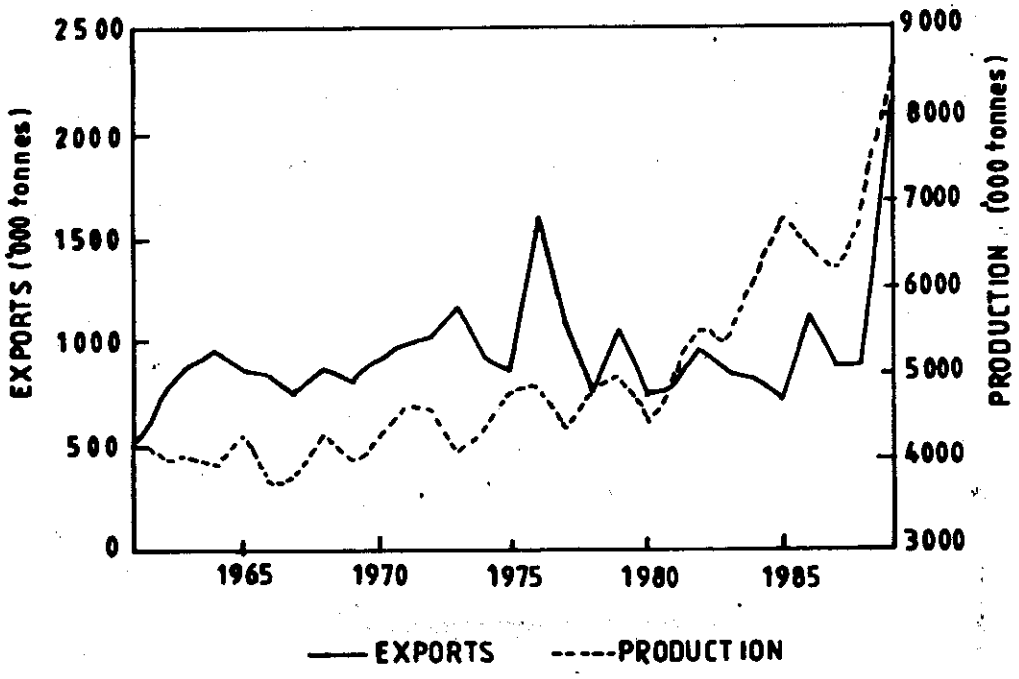

Figure 3: Indian Oilmeals Production and Oilmeals Exports, 1961-90