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Tracking India's Protein Price Inflation

RBI's Deputy Governor Dr. Subir Gokarn highlighted a new dimension in the debate on surging food inflation in India. In a speech (The Price of Protein, October 26 2010), he pointed how dynamics of inflation and in particular food have changed in India. Earlier food inflation was mainly because of rise in prices of crops like wheat/rice or surge in a particular vegetable like onion. However, in the period 2009-11 food inflation had risen not because of these items but because of proteins.

Gokarn's analysis points that incomes have risen in India thanks to its high growth phase since 2003. The higher incomes in turn have led people to demand and consume more nutritious protein based food items like milk, eggs and meat products. As supplies of these items have not risen in line with demand, the end result is persistent inflation in these food items. This has first driven food inflation and then has led to a more generalised inflation.

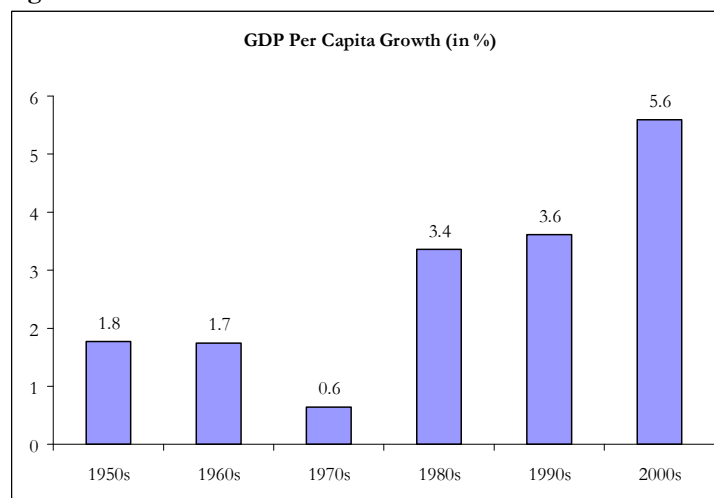
This paper looks at this new factor responsible for rise in inflation. It analyses protein price inflation in India over the years and possible factors for the underlying trend.

I. Changes in Food Consumption Basket Since 1950s

Economics theory says that as incomes grow people shift their food consumption from cereals/staples to more protein based items. Another change is as incomes rise, expenditure on food as a percent of total income declines.

We should be seeing the same in India as incomes have risen over the years. If we look at India's per capita income levels over the years, we see that growth in per capita income mainly picked up in 1980s and accelerated in 2000s. Based on this growth in income, the food consumption patterns should also change.

Figure 1



Source: RBI



This growth in per capita income over the years should reflect in composition of the WPI index. The WPI index is reconstituted roughly once in every ten years with a new base-year to make the index in line with changes in economy. Hence with growing incomes, we should be seeing both the above highlighted trends. First, decline in weight of food basket in the overall index. Second, within food basket, we should see rise in weights of protein & decline in cereals. Table 1 looks at these two trends in different WPI index base-years since 1952-53. Table 2 looks at various food articles as a percentage of total food articles index.

WPI Index Base Year	Food Articles (1)	Cereals (2)	Fruits And Vegetables (3)	Pulses (4)	Milk (5)	Eggs, Meat and Fish (6)	Total Protein Weight (4+5+6)
1952-53	50.4	19.3	2.3	4.2	8.4	1.7	14.3
1961-62	41.3	12.1	2.4	2.7	3.0	2.0	7.7
1970-71	29.8	10.7	6.1	2.2	4.5	1.9	8.6
1981-82	17.4	6.8	4.1	1.1	2.0	1.8	4.9
1993-94	15.4	4.4	2.9	0.6	4.4	2.2	7.2
2004-05	14.3	3.4	3.8	0.7	3.2	2.4	6.4

Source: Planning Commission, Commerce Ministry

WPI Index Base Year	Cereals (1)	Fruits And Vegetables (2)	Pulses (3)	Milk (4)	Eggs, Meat and Fish (5)	Total Protein Weight (3+4+5)
1952-53	38.3	4.6	8.3	16.7	3.4	28.4
1961-62	29.3	5.8	6.5	7.3	4.8	18.6
1970-71	35.9	20.5	7.4	15.1	6.4	28.9
1981-82	39.1	23.6	6.3	11.5	10.3	28.2
1993-94	28.6	18.8	3.9	28.6	14.3	46.8
2004-05	23.5	26.8	5.0	22.6	16.8	44.4

Source: Planning Commission, Commerce Ministry

- We see decline of food articles weight in the WPI index. It was 50% of the WPI index in 1952-53 base-year and has declined by more than one third to 14.3% in 2004-05 base-year.
- Within food articles, we see decline in cereals (rice, wheat etc) from 19.3 in 1952.53 to 3.4 in 2004-05. As a percentage of food articles, cereals were 38% of food articles index in 1952-53 which has declined to 24% in 2004-05. However, the decline has not been consistent. In 1961-62 cereals declined to 29.3% of food articles index but were raised to touch 39.1% of food articles in 1981-82. It then declined in subsequent base years
- There is no official definition of proteins but WPI index constitutes following protein items:
 - Pulses
 - Milk
 - Eggs, Meat and Fish.



We do see rise in share of protein items in food articles index from 28.4% in 1952-53 to 44.4% in 2004-05. Though, it is odd that the share of protein index was higher in 1993-94 series at 46.8% of food articles index compared to 44.4% in 2004-05 series. Ideally, the incomes have risen higher in 2000s decade and the share of protein should have been higher than seen in 1993-94.

Within proteins, we see persistent rise only in share of Eggs, Meat and Fish from 3.4% of food articles index in 1952-53 series to 16.8% in 2004-05 series. The other items like pulses and milk are more random. Share of both pulses and milk with rise in one base-year followed by decline in the other. In both, the share of weight in 2004-05 is lower than the weight seen in 1993-94.

- Fruits and vegetables is another important category. Apart from more proteins, people also have more fruits and vegetables with rising incomes. Both fruits and vegetables are important sources of carbohydrates, vitamins etc and help in raising health standards. In India's case where there are large numbers of vegetarians, they form a major part of the diet as well. The weight of fruits and vegetables has risen consistently from 1951-52 to 1981-82 but declined in 1993-94 and then rises in 2004-05.

Overall, the series of WPI indices do reflect the changes in food consumption behavior in line with the economic theory. The share of food in overall WPI basket also declines indicating changes in overall consumption pattern. However, the share of proteins in food basket does not really confirm with the economic trends. Share of protein has risen over the years, but it is lower in 2004-05 (compared to 1993-94) when it should have been the highest. As the 2004-05 series was released in Sep-10 one cannot even say that higher growth in per capita incomes was not expected. The incomes grew fastest in the period 2003-08 and we should have ideally seen higher weights for protein.

II. Protein Inflation Over The Years

Table 3 looks at average inflation levels in each of the base years of various food items discussed above.

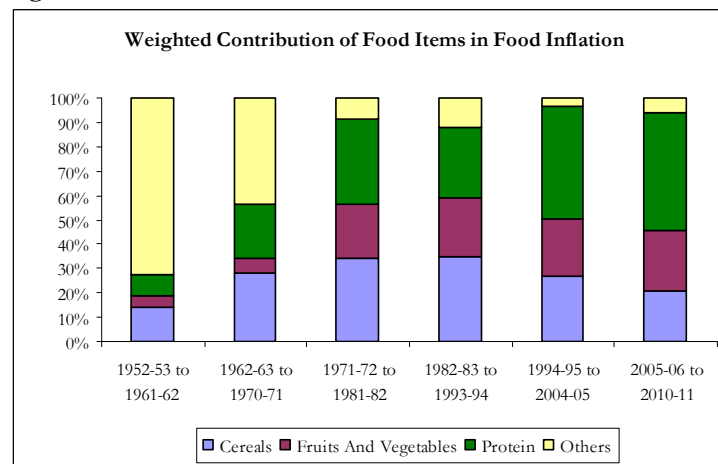
WPI Index Base Year	Period	Food Articles	Cereals (1)	Fruits And Vegetables (2)	Pulses (3)	Milk (4)	Eggs, Meat and Fish (5)	Average Protein (3,4,5)
1952-53	1952-53 to 1961-62	2.4	0.9	2.4	0.8	1.8	2.8	0.8
1961-62	1962-63 to 1970-71	8.6	8.3	8.6	12.7	9.7	9.0	10.1
1970-71	1971-72 to 1981-82	8.5	8.1	9.1	13.5	7.1	11.0	10.4
1981-82	1982-83 to 1993-94	9.2	8.2	9.6	10.4	9.0	9.4	9.5
1993-94	1994-95 to 2004-05	5.9	5.6	7.4	5.5	5.7	6.4	5.8
2004-05	2005-06 to 2010-11	10.3	9.2	9.5	12.5	10.1	11.6	11.3
2004-05	Apr – Jul 2011-12	8.9	5.0	15.7	-8.2	8.1	9.1	2.5

Source: Planning Commission, Commerce Ministry



- Barring 1950s and period of 1994-95 to 2004-05, we see persistent food inflation across most decades. Food inflation averages 8.4% in the period 1960-94, which is very high. Food inflation again picks up in 2004-05 series and touches an average of 10.3%, which is also the highest average inflation amidst different series.
- Within food articles, we have high inflation across sub-sectors in 1960-94 and 2004-05 series. In 1993-94, inflation moderates across the categories barring fruits and vegetables which does not decline as much as others.
- In protein sub-sector, the average inflation in 1961-94 is around 10%. The inflation declines between 1994-05 to 5.8% and again surges to 11.3% in the period 2005-10. Hence, the assertion that this rise in price of proteins is limited to 2005-06 period is not really correct. It is true that the protein inflation has been higher in 2005-06 onwards period but is not an exceptional case. India has been facing high protein inflation for most of the period since independence. The average protein inflation since 1952 is around 8% which is very high given the fact that per capita incomes have started rising only post 1991 reforms. In Apr-Jul 2011-12, we see some moderation in protein index on account of decline in prices of pulses.
- Inflation in Fruits and vegetables has been above 7% in all time-series except 1952-53 and has surged to 15.7% in Apr-Jul 2011-12 period.

However, we should also look at the weighted inflation of the above food items. The absolute inflation numbers do not impact inflation one to one. The weights of different items determine the contribution to headline food inflation. Figure 2 shows the weighted contribution of protein items to overall food inflation has been rising in each time-series. On an average, protein contributed just 9% to total food inflation in 1952-62 period which rose to 48.4% in 2004-10. It was around 46% in 1993-94 series. Hence despite protein inflation being lower in 1993-94 series, it still contributed nearly 50% of total food inflation. Within proteins, contribution of eggs, meat and fish has risen in every time-series and contributes around 19% of total food inflation in 2004-05 series. Milk contributes 22% to food inflation in 2004-05 series (lower than 27.7% seen in 1993-94 series) and pulses contribute 6.1% of total food inflation (higher than 3.6% in 1993-34 series). Contribution of fruits and vegetables is steady at 24%-25% since 1970s.

Figure 2


Source: Planning Commission, Commerce Ministry

The average inflation analysis shows protein inflation has been high in most time-series and is not a recent trend. However, the weighted inflation average analysis shows the contribution of protein inflation to food inflation has been rising steadily and hence it could have been ignored by policymakers as a potential concern.

III. Supply Factors

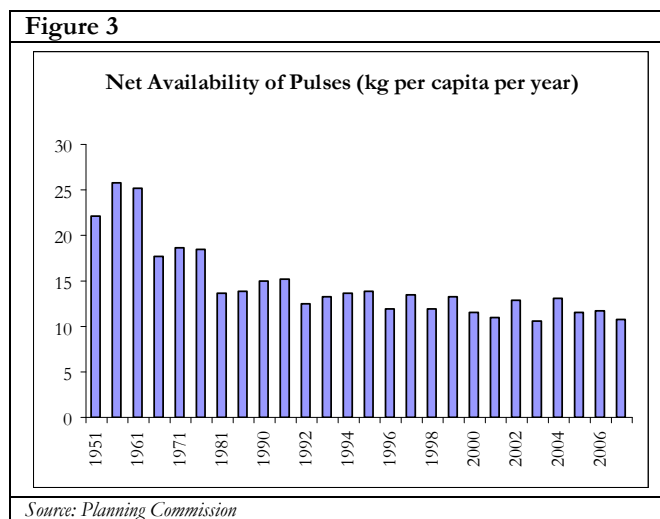
We looked at supply factors in detail in our publication on agriculture situation in India (Why food inflation is likely to remain persistent in India?, 11-Jan-11). The report looked at supply factors of food articles in general and showed how overall productivity and yields levels have declined over decades. The prime reasons for this decline have been lower investments in agriculture, decline in farm sizes and dependence on monsoons.

Table 4 looks at average growth rates in production of cereals and protein items.

	Total Food Grains	Total Cereals	Pulses	Milk	Eggs	Fish	Meat
1950s	5.08	5.19	4.83	--	--	--	--
1960s	3.25	3.62	1.62	--	--	--	--
1970s	1.58	1.99	-1.99	--	--	--	--
1980s	4.96	4.98	4.90	5.41	7.86	3.05	--
1990s	2.18	2.29	0.94	4.30	4.20	1.45	--
2000s	0.93	0.88	1.99	3.70	7.12	-0.98	8.87

Source: Department of Animal Husbandry, Dairying & Fisheries, Planning Commission, RBI

- In pulses, the average production touched a low in 1990s and has improved recently in 2000s. Even in 2000s, the annual growth in pulses is highly volatile and does not show consistent growth. The production level of pulses in 2009-10 is at 14.66 MT (million tonnes) lower than 14.91 MT reached in 1998-99. Another alarming indicator is per capital availability of pulses which has declined every year. In 1951, every person could get 22.1 kg of pulses which has halved to 10.7 kg by 2007. Hence, with growing incomes and prosperity, every individual is actually getting lesser amount of pulses when he would need more.





- In the Union Budget for 2010-11 the Finance Minister proposed to extend the green revolution to the eastern region of the country comprising Bihar, Chattisgarh, Jharkhand, Eastern UP, West Bengal and Orissa, with the active involvement of Gram Sabhas and the farming families. He also proposed to organise 60,000 "pulses and oil seed villages" in rain-fed areas during 2010-11 and provide an integrated intervention for water harvesting, watershed management and soil health, to enhance the productivity of the dry land farming areas. Any supply side measure takes time to fructify and increase in production of pulses needs to be worked upon urgently.
- In milk, the growth rates have been lower in reporting decade compared to previous decades. Production in milk has been higher every year but growth rates are lower than seen in 1970s and 1980s. The growth rates were higher in 1970s due to the white revolution which led to jump (called Operation Flood) in milk production. There have been several mentions of having another white revolution to increase milk production. Despite increase in production every year, it is not enough to cater to demand of growing populations and incomes.
- With respect to eggs, the average growth rate declined in 1990s compared to 1980s and then again increased in 2000s. Though, average growth rates in 2000s are still lower than average growth rates seen in 1970s.
- In fish also average growth rates have slipped in every decade since 1980s. Out of the 10 years in 200s, there is negative growth in four years and from 2005-10 the average growth is -0.62%. The production is 43.2 lakh tonnes in 2009-10 which are lowest levels since 1996-97 when it was 44.4 lakh tonnes.
- For meat we do not have adequate data across decades to make comparison. However, we must add that growth rate is not consistent across the years and is actually very random. In ten years since 2000-01, annual growth rate is 0 in four years and touches 10.5% in 2002-03 and 60.9% in 2007-08. These numbers drive the overall averages.

The overall production picture is the same as seen in case of overall foodgrains and cereals. Growth rates of production of these protein items have slipped in those years in which much higher growth rates are needed. Higher investments and improvements in technologies are needed to improve the supplies of protein based items. The dwindling supplies are putting further pressure on protein inflation coupled with rising income and demand.

IV. Concluding Thoughts

Inflation in protein based items has been highlighted as the major source for food inflation since 2005. Deepak Mohanty, RBI's Executive Director in a speech (Changing Inflation Dynamics in India, 13-Aug-11) terms this rise as "structural food inflation" as inflation in these items has become persistent. His research shows persistence is particularly high for protein items like milk. This is the inevitable consequence of rising affluence in India. The real growth rates in monthly per capital expenditure have risen from 0.2% in 2000-05 to 1.2% in 2005-10 for rural and from 1.3% in 2000-05 to 2.0% in 2005-10 for urban areas. As a result, the share of proteins in food consumption has risen from 27% in 2004-05 to 30% in 2009-10 for rural and from 28% to 32% in the same period for urban.



Our analysis looks at a much longer term picture and shows inflation from protein based items has always remained elevated in India barring the period 1993-94 to 2004-05. If one looks at the history of food inflation in India, high protein inflation should not really be a surprise.

The policymakers and markets are surprised over this persistence as food and protein inflation had moderated in 1990s and carried till first half of 2000s. It was being felt that we have brought this food inflation under control and is expected to remain low in future. It also partly explains why investments in agriculture started to decline around this time as policymakers felt food inflation is not a problem anymore barring drought years.

However, huge spurt in growth rates from 2003 onwards (which very few anticipated) tilted the scales again in favor of high food and protein inflation. India never saw rises like these and per capita incomes rose at an average of 7% between 2003-10 leading to more demand for food items particularly protein based items. Policymakers were not really prepared for such rises and hence have fallen short on most food economics grounds. Social programs like MGNREGA also helped raise rural incomes leading to this rise in food and protein inflation.

The historical analysis also shows how India faced high protein and food inflation despite slow-growth years. It has been a problem for a very long time. Now with India expected to grow at 8% plus levels (though cracks are surfacing on this trajectory of growth, see our report - India's Potential Growth: A Reality Check, 8-Aug-11) for next ten years or so, the pressures on these prices are expected to remain as well. The inclusive growth agenda is likely to bring more people out of poverty. The government is proposing a food security bill which apart from providing foodgrains to poor also intends to improve their health levels via better provision of nutrition as well. All these factors indicate pressure on both demand and supply of food and protein items is expected to be there.

After ignoring agriculture in 1990s and most of 2000s, policymakers are again being forced to focus on agriculture. Till now, we were looking at agriculture only from an employment perspective as people had not shifted from agriculture to other productive sectors. So there was a need to educate and train people to facilitate their shift to more productive areas. Now, we are looking at a problem which has been there in India for a number of years – providing adequate food so that it does not lead to inflationary pressures. This requires a different mindset of infusing more investments and technology in agriculture and showcasing it as a potential growth sector.

India has clearly underestimated its size of population and the impact growth would have on natural resources. Barring food, it needs to assess the impact of inclusive growth on other natural resources as well.



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