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## Indian Feed Industry - A Trend Analysis



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*This paper has tried to bring out the facts and figures along with insights and analysis about the Indian feed industry. The analysis may be useful for policy makers, dairy players and stakeholder to understand the gaps and issues related to feed industry thereby impact on dairy development in India.*

**Key Words :** Dairy, feed industry

### Introduction:

Dairy development has assumed significant importance in the rural economy of India due to its immense potential for supplementing income and employment generation for the rural people. (Babu & Verma, 2010).

India has one of the largest livestock population in the world and one of its notable characteristics is that almost its entire feed requirement is met from crop residues and by products; grasses, weeds, and tree leaved gathered from cultivated and uncultivated lands. (Dikshit & BIRTHAL, 2010).

Supply of feed has always remained short of normative requirement, restricting realization of the true production potential of livestock (GoI 1976). BIRTHAL and Jha (2005) has found feed scarcity as the main limiting factor to improving livestock productivity. Therefore, to increase the productivity potential of milch animals the use of commercial compound feed is inevitable as supply of feed & fodder is shortening due to shrinking pasture land in the country.

The Indian feed industry is about 35 years old. It is mainly restricted to dairy and poultry feed manufacturing; the beef and pork industry is almost non-existent. Which represents only 5 percent of the total potential, and feed exports are not very high. The Indian Animal feed market was an estimated ~79.5 million tonnes in 2014 (all livestock & aqua). However, the actual market is much smaller because a large portion of this market is serviced by the unorganized (grazing) sector.

The three key types of Compound cattle-feed producers are:

- Home-mixers (Unorganized)- 33% (> 20000 feed manufactures)
- Dairy cooperatives -42%
- Private sector manufacturers of compound cattle feed- 25% (832 feed manufacturers)

The Organized Animal feed manufacturers are producing around 30 Million tonnes of commercial feed. Out of total production, Commercial production of **cattle feed** is about 8 million tonnes (organized manufacturers, as for eg Godrej Agrovet is manufacturing 1 million tonne of animal feed and is the largest compound feed manufacturer in India). Godrej Agro vet has tie-up with some of major dairy companies like Creamline Dairy, Heritage

Dairy, Hatsun Dairy for cattle feed distribution). India exported 2000 tonnes of cattle feed (mainly maize basal) in current year and imported 9000 tonnes of copra based cake and feed supplement.

India is exporting 74% of cattle feed to Pakistan and 21% to Belgium and importing 37% of cattle feed from Indonesia and 17% from Srilanka. However, in value terms China is the largest exporter to India. Mainly vet supplement like-Folic acid based medicines, Vitamins are imported into India from China.

The land area under permanent pastures and grazing is about 10.36 million hectares and constitutes about 38% of total uncultivated land excluding fallow land in the country. It is a major source of cattle feeding fodder. Cooperatives, with 46% share of the compound cattle feed industry, produce low-cost feed for their members. Home-mixers are farmers who prepare their own feed mixtures and constitute 32%. Private compound cattle feed manufacturers constitute about 22%. Dairy cooperatives in India supply low cost compound feed to farmer members while private feed manufacturers mainly cater to the requirements of farmers with independent operations and the buffalo meat industry.

Low quality forages form the bulk of basal diet of bovine in India. In addition, farmers feed their animals one or two locally available concentrate ingredients, depending upon the level of milk production, unmindful of animals'

requirement. This type of diet is not always able to meet protein, energy, minerals and vitamin requirements of animals. As a result, animals either do not produce milk as per their genetic potential or else, the cost of milk production is high on account of imbalanced feeding.

#### Method of Study

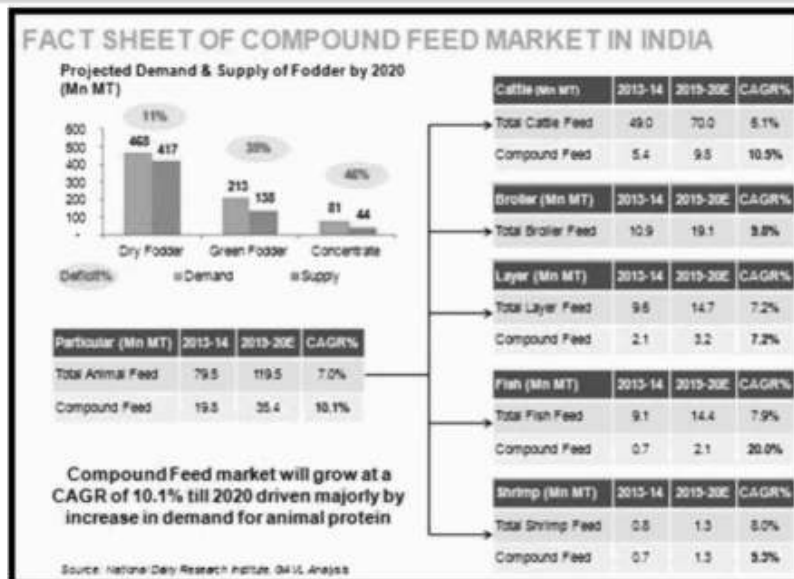
Combination of Primary and secondary study was done to collect information, data and insights for analysis of the Indian feed industry. The paper made use of data from various published and unpublished sources viz: NIANP, Bangalore, CLFMA, Mumbai, Interviewing Industry expert and stakeholders and websites.

#### Quantities of feed fed to different species within household premise & Fact Sheet of Compound Feed Market in India

As per CLFMA (Compound Livestock Feed Manufacturers Association) study/source, it was gathered that quantities of feed fed to different species within household premise/farmer shown in below table.

Different feed ingredients are rich in different nutrients. In view of this, it was felt that if different grains, brans, protein meals/cakes, chunnies, agro-industrial by products, minerals and vitamins are mixed in suitable proportion and this mixture is fed to animals along with the basal diet, concentrate ingredients, which varies in composition in accordance with the animal type, season, region etc. Is called compound cattle feed. Compound cattle feed could be in the form of mash, pellets, crumble, cubes etc.

Quantities of feed fed to different species within household premise					
(Kg/animal/day)					
Animal		Feed Types			
	Ave. weight (Kg)	Green Fodder	Dry fodder	Concentrates	Grazing
<b>Cattle</b>					
In Milk	280	4.75	5.5	0.64	1.18
Dry	245	3.4	4.02	0.4	1.27
Adult Male	278	4.06	6.03	0.33	3.07
Young Stock	118	2.18	2.13	0.18	1.78
<b>Buffalo</b>					
In Milk	355	5.96	6.34	1.05	2.94
Dry	350	5.44	4.95	0.52	4.28
Adult Male	327	4.04	7.47	0.36	3.09
Young Stock	142	2.29	2.22	0.19	3.81



### Main Ingredients of cattle feed used in India

Grains	Maize, Sorghum, wheat, rice, oats, barley, ragi, millets
Brans	De-oiled rice bran, rice polish, wheat bran, maize bran etc
Protein meals/cakes Chunnies	Rape seed meal/cake, soybean meal, cottonseed meal/cake (decorticated and un-decorticated), groundnut meal/cake, coconut meal/cake, palm kernel meal/cake, sesame cake, linseed cake, maize germ oil cake, maize gluten meal, sunflower meal, kardi (safflower) meal, guar meal. Guar, tur, urd, moong, gram & chunnies of other locally available pulses
Agro Industrail by products	Molasses, babul chunni, tamarind seed powder, mango kernel extraction, Prosopis juliflora pods, tapioca waste etc.
Mineral and vitamins	Mineral mixture, calcite power, common salt, di-calcium phosphate, vitamins A, D3 & E
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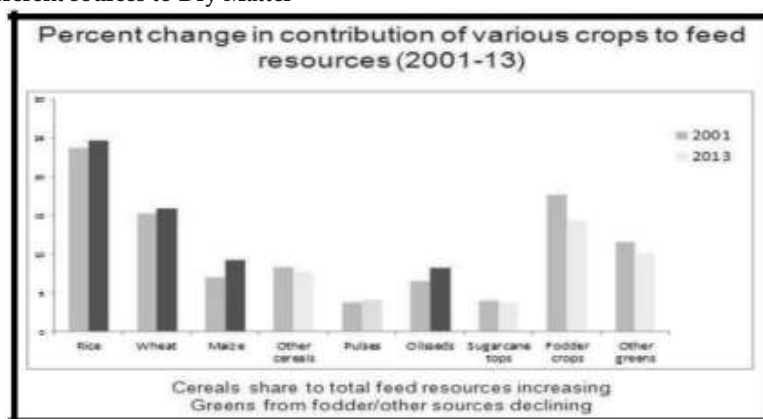
### Different types of Compound Cattle feed

In India low, medium and producing animals in different parts of the country, therefore, different types of feeds are produced by feed milling plants. Variations in feed formulations are also necessary due to

availability of different basal feeds in different seasons. Specification for three different types of feeds recommended by the Feed and fodder group, constituted by the Department of Animal Husbandry & Dairying, GOI are given below:

Specifications for compound feed on DM (Dry Matter) basis			
Characteristics	Requirement		
	Type-1	Type-2	Type-3
Crude protein (%) min	22	20	18
Crude Fat %	4	2.5	2
Crude fibre % Max	10	12	15
Sand Silica % Max	3	4	5
Vitamin A (IU/Kg), Min	7000	7000	7000
Vitamin D3 (IU/Kg), Min	1200	1200	1200
Vitamin E (IU/Kg), Min	30	30	30
Common Salt (%), Max	1	1	1
Calcium % Min	0.8	0.8	0.8
Phophorus %, Min	0.5	0.5	0.5
Available Phosporus % Min	0.25	0.25	0.25
Aflatoxin B1 (ppb), Max	50	50	50

### Contribution of different sources to Dry Matter



### How much Compound feed Cattle to be fed

Cattle Feed can be fed directly or by mixing it with chaffed dry/green fodder. Cattle feed need not to be cooked or

pre-soaked before feeding. If compound feed is uniformly mixed with forages and fed, results are better. Animals need to be fed compound feed as follows:

Particulars	Cows (400 kg body wt.)	Buffaloes (500 kg body wt.)
For maintenance	1.5 - 2.0 kg	2.0 - 2.5 kg
For milk production (per litre)	400 grams	500 grams
For pregnancy	2.0 kg (last two months)	2.0 - 2.5 kg (last two months)

If 15-20 Kg good quality cultivated green fodder is available for feeding the animals, then compound feed for body maintenance need not be given.

Presently, in India only two types of compound cattle feeds are manufactured for adult animals. Considering the increase in milk yield, regional variation in feed availability, preference of farmers it is required to produce different varieties of compound cattle feed. As per NDDB guidelines, NDDB also promotes use of different compound feeds such as, calf starter, calf growth meal, feed for high yielding animals, feed for low yielding animals, buffalo feed, feed for dry or pregnant animals etc.

But in field observation only milking animals are fed with compound feed. We have not seen Compound feed feeding in Calf & dry animals. Further, farmers with one two animals are hardly serious for use of compound feed except during lactation period. It was found during interaction with farmers in different regions of major milk producing states that proper knowledge about benefits of use of compound feed is missing and high price of compound feed is another big concern among progressive farmers. During my visit to Bihar & Bengal, farmers want Compound feed in the rate home - made concentrate (Rice Bran+ Jaggery @Rs 15-20 Kg) or at the price at which unorganized feed manufacturers are offering the product. It was seen that local feed manufacturers (unregistered/unlicensed) are selling feed in the range of Rs 20-40/- per Kg.

During meeting with some of registered and big Compound feed manufacturer, it was understood that they also sell two types of Compound feed- High priced and low priced, but they did not reveal the ingredients and specifications. As per our broad estimates, Godrej Agrovet is able to sell 50000 MT of Compound feed in Maharashtra, 50000 MT in Tamilnadu & Karnataka, 25000 MT in Bihar. No registered Compound manufacturers were willing to talk about prescribed standards of low price Compound feed quality.

### Issues with feed & fodder in India

- As per XII five year plan of the Government of India, 5-6% of growth rate in feed & fodder require to address the challenge of shortage of feed & fodder.
- Deficiency of feed and fodder accounts for half of the total loss in livestock production potential.
- Quality data and timeliness of data availability are serious issues.
- Only 5% of the farm household are able to access any information on animal husbandry against 40% of crop farming.
- Development of the cattle feed sector has not received enough attention in the past. (NDDB provide advisory services on commercial feed manufacturing only to the Cooperatives)
- Inadequate marketing ,financial and infrastructure support.

Changes in the area under fodder, forest, fallow, pasture and cultivable wasteland				
Category & area (million Ha)	1990	2010	2020*	% change over 1990
Gross cropped areas (Excluding fodder crops)	174.1	188	196	13.0
Fodder crops	8.26	7.88	7.09	-14.2
Forest	67.4	69.6	69.3	2.79
Permanent pastures & grazing	11.3	10.2	9.49	-16.0
Misc. tree cops & groves not included	3.80	3.28	3.15	-17.1
Cultivable wasteland	15.1	12.9	11.8	-22.2
Current fallow	13.7	15.7	14.34	5.11
Other fallow	10.3	9.77	9.79	-4.67
* NIANP Projections				
Declining fodder area, CPRs and plateau in the area & productivity of food crops				

During meeting with Dr. RaghvendraBhatta, Director, National Institute of Animal Nutrition and Physiology, (NIANP), Bangalore it was understood that area under Fodder crops, Permanent Pastures & Grazing and Cultivable wastelands which are the major source of cattle feed is shrinking drastically due to increase in demand for real estate and infrastructure.

Further, large amount of useful paddy straw for livestock is being burnt in the major Paddy producing states of India. The Paddy straw is one of major source of dry fodder for bovine in India, but handling and marketing constraint at farmer level is the major reason behind burning of the same in field.

Dr. Raghvendra also informed that the impact of climate change is several regions are now visible and it is posing challenge to livestock & live stock systems and need to modify animal diets as increased temperature increase lignifications of plant tissue and reduce the digestibility and rates of degradation of plant species.

He suggested that small technological interventions in feed & fodder management may bring big positive impact and will solve fodder issue at maximum extent.

#### **Crop residue Management :**

- Bailing- dry fodder, transport and minimize losses
- Chaffing & Storage- reduce wastage and improve intake

Crop	Production	Surplus for crushing	Meal Conversion	Export
Soybean	7.8	6.2	5	0.6
Rape Seed	5	4.6	2.7	1
G. Nut	4.2	0.42	.25	.003
Rice bran (deoiled)	10	-	8	.3

Primary study on De-oiled rice bran use and its availability in major states revealed that Deoiled rice bran (present rate- Rs 10/- 11/- per Kg) is used as major source of protein for animal feed in western part of country. AMUL (Anand

- Urea Treatment- enrichment with nitrogen leading to better utilization
- Strategic supplementation- Improves the utilization of nutrients and improves productivity

#### **Green fodder Management :**

Strengthening of fodder

Seed chain

- Varietal and Management improvement
- Hay & silage making

#### **Use of Alternate source of Feed :**

Castor, Karanj, Neem, Mahua, Shea nut cake, Jatropa, Tomato Pomace , Brewery Waste, Areach sheath, Azola (algae), Pineapple fruit residue, Banana leaves, Cassava tops, Corn cob, Cotton seed hull, Sunflower head, Coffee pulp, Coffee bran/hull, Cocoa pods.

As per our estimate, the export of oil seed cake/meal has drastically came down in India from 5 Million tonne to 2 million tonnes from 2011, due to low production of oil seeds. Currently India is exporting around 2 Million tonnes of protein meal to South Korea and Middle east countries and other side import of oil seed cake/meal is limited to save guard the domestic producers. Hence, such scenario will impact the compound feed manufacturers who are using oil seed meal as base material for commercial feed.

Milk Union Limited) and other major dairy cooperatives are buying large quantity of Rice bran as a basal for low cost compound feed production.

	Parameter	Gujarat	Chattisgarh	Karnatka	Punjab	Haryana	AP
1	Cattle Population	High	Low	High	Medium	Medium	High
2	Poultry Population	Low	Low	High	High	High	High
3	Aqua farming (Fish cultivation)	Low					High
4	Animal feed & Poultry feed Requirement	High	Low	Medium-high	medium	medium	High
5	DORB Production in state	Very low	high	low	high	high	Very high
6	DORB Requirement in State	Very high	Low	Medium	Medium	Low	Very high
7	DORB (Surplus or Deficit)	Deficit	Surplus	marginal deficit	Surplus	Surplus	Equal
8	Need for purchase/sale from/to other state	Purchase (high)	Sale ( high)	Purchase low	Sale high	Sale high	equal
9	DOC available of other Major crops grown (in state)	Cotton seed Groundnut Cake	Soybean Cake	Mustard cake	Sunflower, Mustard	Sunflower, Mustard	GN, Cotton
10	Relative price of DORB compared to DOC (soy, mustard, GN, Cotton etc)	Very low					

In above table, multiple parameters have been taken into consideration for assessment of exiting dairy/poultry feed demand dynamics along with availability of DORB in respective state. This also indicates Surplus/deficit state in terms of DORB Production.

As visible in above table, Punjab, Haryana & Chhattisgarh is surplus states where as Gujarat, Rajasthan (not in table) is most deficit state as far as DORB is concerned. Hence demand from deficit state dictates price of DORB prevailing in Punjab and Haryana. (Note: relative price of other DOC in market is also taken into consideration)

Further major consumption of animal/poultry feed is reported in Punjab, Gujarat, UP, Rajasthan, Maharashtra, AP, Karnataka and Tamil Nadu (Mostly western & southern states). Movement of DORB is reported from surplus states to deficit states and requirement in deficit states dictates its price. Normally DORB from Punjab & Haryana is transported to Gujarat & Rajasthan and purchase price in Gujarat becomes the benchmark price for DORB in these states.

To bring to notice, West Bengal (Eastern India) is one of the leading producers of de-oiled rice bran. The high railway freight from West Bengal to western or southern India makes transport unviable for the producers in Eastern India, thereby compelling them to export de-oiled rice bran to the neighboring countries.

Drought or excessive rain in few provinces, El Nino impact, paddy/ edible oil crop failure in one or multiple state drives relative DORB demand in the market. The net realization from sale of DORB, influences solvent extraction margin and indirectly affects pricing of CRBO as well. Hence parity in DORB sales realization is one of the indicators of rising/declining pace for production of CRBO.

Though Rice bran must be processed immediately after milling within 1-5 days (if possible), a solvent extractor has no choice but to do extraction irrespective of DORB price ruling high or lower (if bran already purchased). However, if parity is not met he will stock DORB&sales at appropriate time. As demand for CRBO for last 3-4 yr has been very encouraging with expectation of rising demand and prospective future, a higher extraction of more RiceBran may be visible in next 3-5 yr.

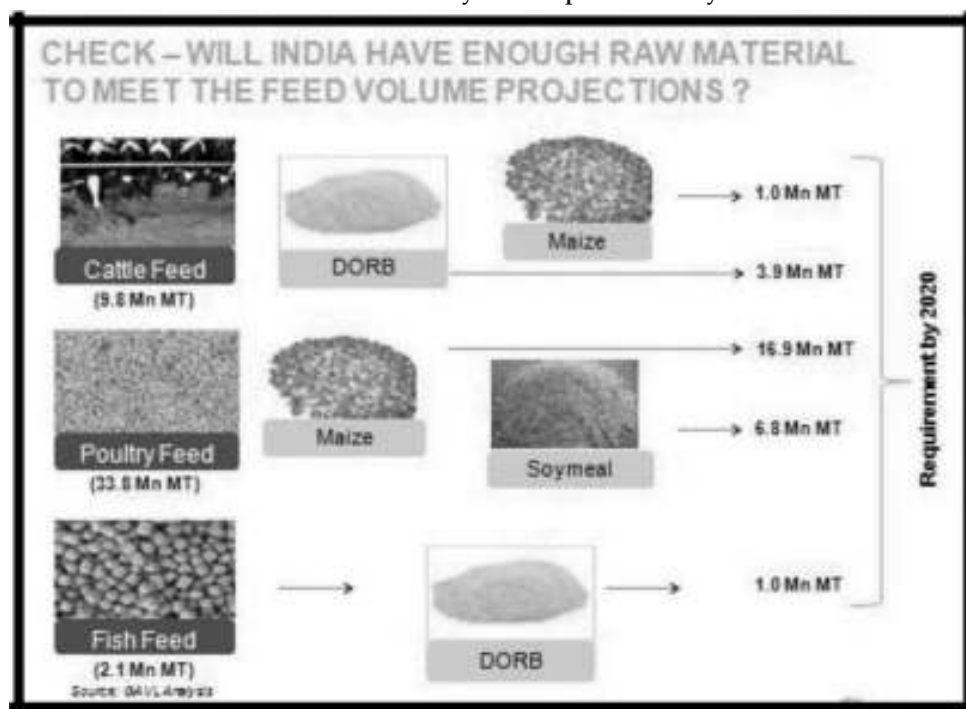
The Recent ban on beef product in India is indirectly helping more feed/fodder requirement for dry animal. As dry animal could not be culled and have to fed with additional feed/fodder to keep it alive. This indirectly, may push marginal additional demand for all feed products including DORB.

At Poultry feed industry front, seasonal demand from this industry also influences pricing of DORB. During winter month, demand of feed material rises, whereas in summer it reduces by 20-25%.

#### Raw Material Requirement for Compound feed by 2020

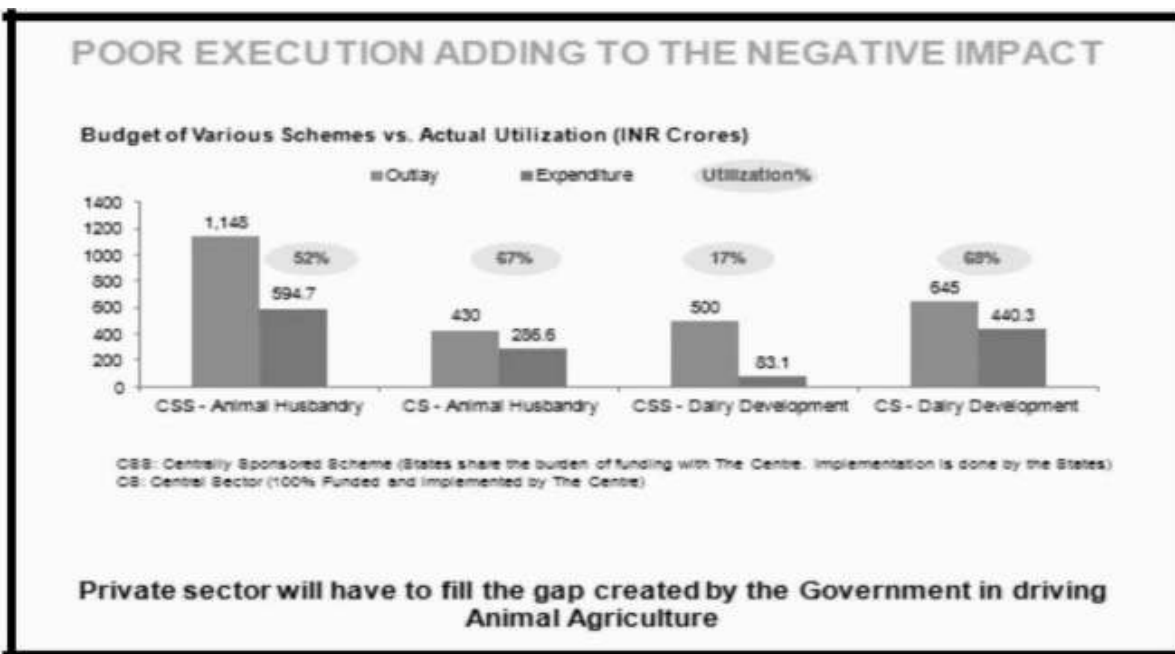
CHECK – WILL INDIA HAVE ENOUGH RAW MATERIAL TO MEET THE FEED VOLUME PROJECTIONS ?					
Feed Raw Material	Actual Raw Material	Requirement of Actual Raw Material for 2014	Production for 2013	Requirement of Actual Raw Material by 2020	Production for 2019 (CAGR of 3%)
Maize	Maize	10.8 Mn MT	23 Mn MT	17.9 Mn MT	27.5 Mn MT
Soymeal (73.8% of Soya Bean)	Soya Bean (1.36x of Soy meal)	5.6 Mn MT	12.5 Mn MT	9.2 Mn MT	14.9 Mn MT
DORB (5.3% of Paddy)	Paddy (19x of DORB)	47.6 Mn MT	155 Mn MT	94.2 Mn MT	185.1 Mn MT
All the raw material requirements for Animal Feed can be satisfactorily met by 2020					
Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture & IAS Analysis Note: Soya Bean to Soy meal Conversion Formula: 10% goes towards seed & human consumption and from the rest 10% oil is extracted					

## Raw Material availability for Compound Feed by 2020



While raw material is not a problem then Govt plan seems like a case of misplaced priority. The below slide is showing poor allocation of funds is Animal Husbandry & Livestock which contributes 23% to the total output from Agriculture.

Further, poor execution adding budget verses actual utilization of funds to the negative impact. Private sector will have to fill the gap created by the Government in driving agriculture. The Gaps to filled mainly in Education of farmers about live stock management.



#### Issues before Compound feed manufacturers in India :

Indian Feed manufacturing Industry is paying higher prices for main protein meal i.e Soy meal than in International price due to high duty paid import & export.

### REDUCE THE IMPORT DUTY ON FEED ADDITIVES

#### GOLD



Import Duty – 10%

#### FEED ADDITIVES



Import Duty – 22%

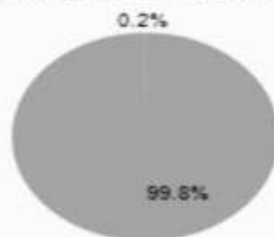
- Animal feed additives market is expected to be INR 2,200 Crores by 2015 ; growing at CAGR of 8%
- ~60% of the additive requirement of the country's requirement is met through Imports
- At 22% duty – The industry is shelling out ~200 Crores in Customs duty

Source: Industry Interviews

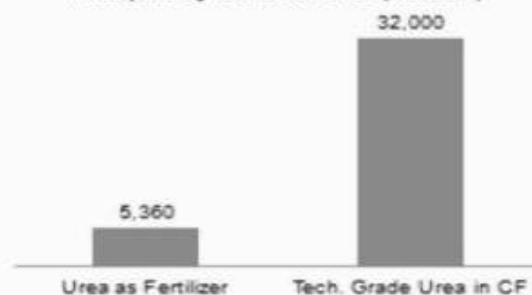
### ALLOWING SUBSIDY ON UREA FOR CF WILL IMPACT THE SUBSIDY BILL marginally

#### Urea consumption as Fertilizer and in CF

■ Urea as fertilizer ■ Urea in CF



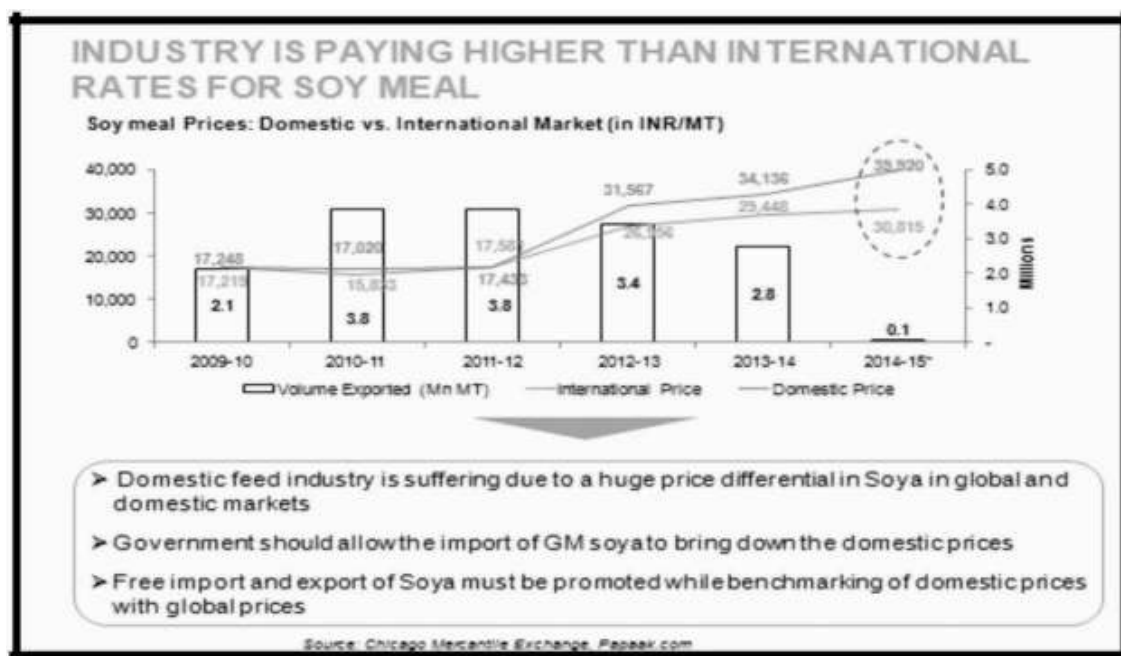
#### Price paid by farmer for Urea ( INR/MT)



- Allowing the Cattle feed manufacturers to use subsidized Urea will cost the Government around INR ~78 crores annually \*
- Urea Subsidy bill was ~36,500 crores in FY13-14 and budgeted at 43,300 crores for FY 14-15

\*Source: The Economic Times, Business Standard





Finally, major issue is Import duty on feed additive which India is majorly importing from China. The high price feed additive for cattle feed is stopping farmers to choose extra supplement for milk enhancement and adding high cost to quality feed.

Eventually, we can say that the commercial/compound feed exploitation is must for better milk production and animal health.

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