

**Commodity Derivatives and Risk Management**  
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**Lecture 20**  
**Commodity Prices Determination (Part 1)**

Welcome to the next session on Commodity derivative and risk management and we will continue with our discussion on what are the factors which influence the spot futures price of or let me repeat. What are the factors which influence the spot prices of soya bean, soya meal and soya oil. Once you get an understanding what are the factors which influencing this spot prices of these commodities and depending upon the happening or non happening of these factors is going to give us a indication of whether future price is going to increase or decrease for these commodities.

So understanding the commodity, the competitors understanding the who the producers who are the consumers who are the value chain partners what are the supply demand factors what are the government regulations is a very important consideration for any commodity when we are analyzing about it.

And you recall last session I just read a small exercise just to test to you for that you will be able to identify soya bean or not. So I do not know whether how many of you were able to identify. but what I was trying to drive at is that if you are going to be a commodity trader or you are going to be a person anything to do with commodity you must understand what is the commodity is all about in its all dimension.

Starting from the first and very basic requirement is to know, feel, touch the commodity and maybe visit manufacturing centre or go talk to the farmers, keep your ears, eyes open and whoever has anything to do with that commodity must meet, talk so that you will be able to understand the commodity, the price risk different parameters associated with that commodity.

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**Factors Influencing Soybean, Soybean Meal and Refined Soy Oil Prices in India**

- Soybean is the most popular and largest produced oilseed. ( about 55% of total oilseed production)
- Soybean seeds are used to extract soyoil and soymeal.
- Soyoil, Soymeals have different types of usage, demand requirements
- <https://www.youtube.com/watch?v=5dlbPVPhJQk>

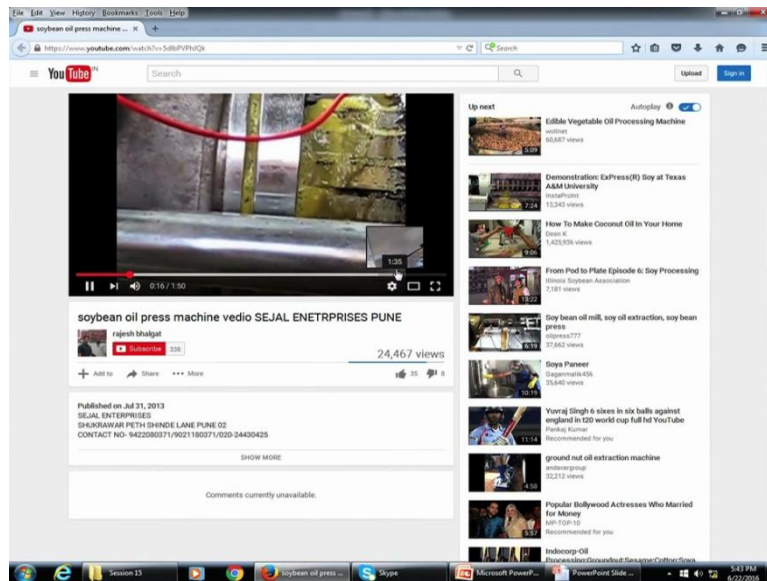


2

Now let us go to the today's agenda we discussed last class about the importance of soya bean, we also discussed that soya soil and soya meal is extracted from crushing soya beans. I am just going to and these pictures which I have is in front of you, one is soya bean when there is still in the in the plant and soya bean is the second picture show soya bean has been crushed to a ripe soya milk that is in a that white colour in the glass that is soya milk.

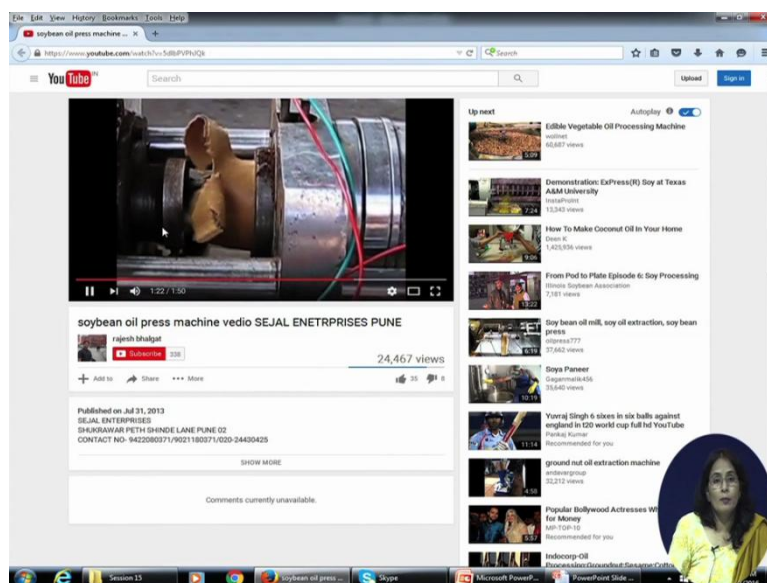
And tofu, it is like paneer or a chenna equivalent of equivalent which is derived from the soya milk. You have soya sauce, I am sure many of you have eaten or you must have been regularly buying soya sauce bottle soya sauce. And other container has soya nuggets or which one of the popular brands which I had already mentioned in the last class, that Nutrela soya nuggets. And the right side of the picture in a bowl you have a soya oil which we predominantly consume and it is a used an edible oil.

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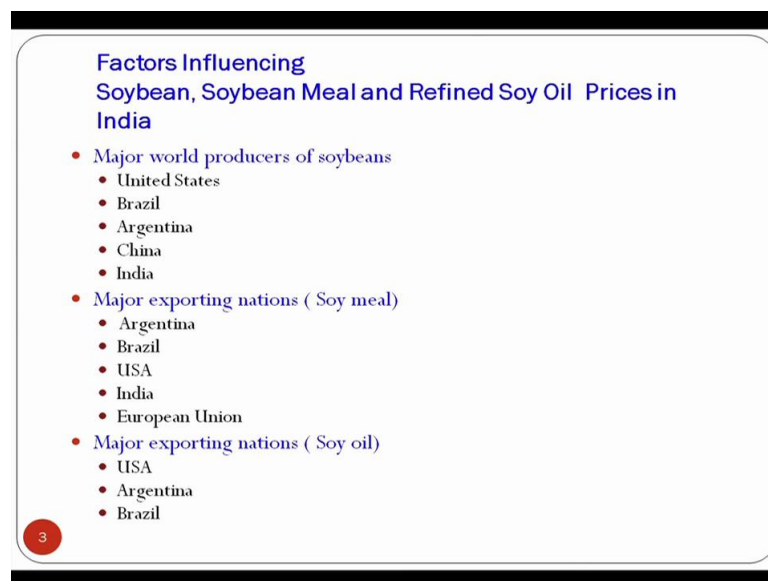
Now this is a ha You Tube video, I want you all to spent maybe couple of minutes on how soya oil is extracted from so by crushing soya meal and soya bean. of course this video is about is about 1\$5 minutes, so let us not spend much of a time on these. So I will just take you to appropriate let met okay this is if you when the oil when the soya bean is crushed, you are getting what you are seeing is the crude soya oil. This has to be refined and basically clean to get the kind of a oil which we consume so there is a also certain other chemical and straining process which are under taken to arrive at the refined soya oil, what we are seeing is the crude soya oil.

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And let me take you to, so if you can see what also another by-product of the whole process is the soya meal. So this soya meal dried this what is extracted getting extracted is the soya meal and from the soya meal you have other soya nuggets and other animal feed or poultry feeds are prepared. So the You Tube link to this particular you the link this you tube video is given with this particular slides so at your leisure time you spent some time. There are many other you tube videos also and I chose the one which have which showed the process quickly and with in a very less time.

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**Factors Influencing Soybean, Soybean Meal and Refined Soy Oil Prices in India**

- Major world producers of soybeans
  - United States
  - Brazil
  - Argentina
  - China
  - India
- Major exporting nations ( Soy meal)
  - Argentina
  - Brazil
  - USA
  - India
  - European Union
- Major exporting nations ( Soy oil)
  - USA
  - Argentina
  - Brazil

3

Now let us go to which are the factors influencing soya bean, soya meal and refined soya oil prices in India. Now we cannot analyze a commodity in isolation, with the export import and India's market getting increasingly integrated with the global market. whatever is happening in the global market, international market those factors also influences the price those factors also influences the price to prevail in Indian market.

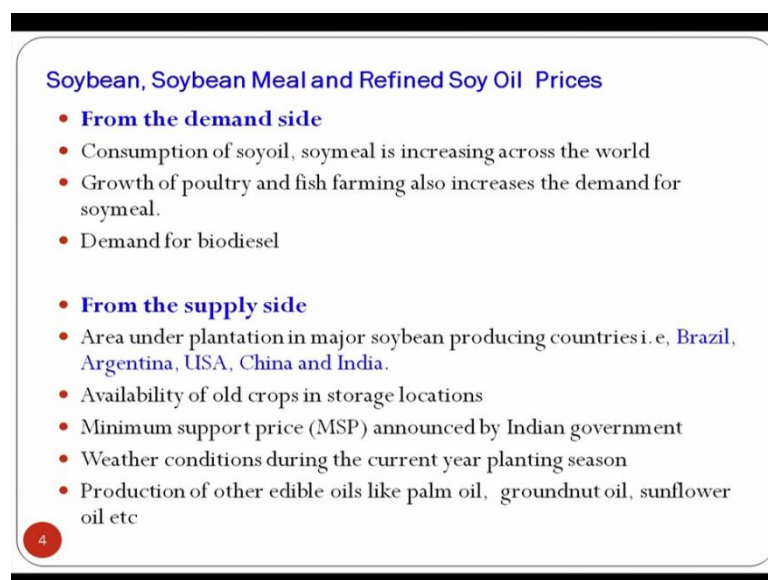
Now for soya bean let us spend a couple of minutes understanding who are the major producing nations, United States, Brazil, Argentina, China and India. India ranked the fifth position in terms of soya bean production and of course India produces around 18 million tons, while United States produces around 108 million tons as per the latest statistics available. And this is the as far as the production of soya bean is concern. Now let us go to the soya meal, so soya meal is exported by Argentina, Brazil, US, India and European Union.

Please see that even if you have china as one of the largest producer of soya bean but it does not export any soya meal because soya meal is consumed domestically for their both animal

feed as well as for their human consumption in terms of tofu and soya milk and soya sauce. Now who are the exporting nations of soya oil? soya oil is majorly exported by US, Argentina and Brazil. What about India? India is the fifth largest producer of soya bean. It also fourth largest exporting nations of soya meal, but what about soya oil? No, India does not export any soya oil.

So we are a nation of oil gojlers in terms of when it whenever it is whenever or with respect to the edible oil. So we import all kinds of edible oils. We import refined soya oil, we refined we import crude soya oil and get it refined at the domestic market. We import palm oil we import sunflower oil, so all kind of other edible oil we import into India.

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**Soybean, Soybean Meal and Refined Soy Oil Prices**

- **From the demand side**
  - Consumption of soyoil, soymeal is increasing across the world
  - Growth of poultry and fish farming also increases the demand for soymeal.
  - Demand for biodiesel
- **From the supply side**
  - Area under plantation in major soybean producing countries i.e, **Brazil, Argentina, USA, China and India.**
  - Availability of old crops in storage locations
  - Minimum support price (MSP) announced by Indian government
  - Weather conditions during the current year planting season
  - Production of other edible oils like palm oil, groundnut oil, sunflower oil etc

Now consider what are the factors which we can summarize, what factors influences the these soya meal, soya meal and soya oil prices? The consumption of soya oil, soya meal is increasing across the world. Growth or poultry and fish farming are also increasing the demand for soybean. Also another interesting dimension which probably many of you may be knowing, the demand for biodiesel is increasing at is growing at a increasing rate and this refined soya oil, soil oil is also use as a bio-diesel. So from the demand side, there is a significant amount of demand for soya oil consumption in India and many Asian countries, you have a significant amount of demand for soya milk consumption in China.

And also in India and other nations depending upon their poultry and fish farming growth and demand for bio-diesel specifically in USA and that bio-diesel demand for USA is substantially higher, so all these things play a play a role all these factors play an important

role in deciding what is going to be the price of these three commodities. From the supply side as we have many times discussed, area under the plantation in major producing nations like Brazil, Argentina, USA, China and India.


Availability of old crops in storage location, this is a very important indicator or what is going to be the availability of older crops for the next year because the quality degradation of soybean does not happen significantly if these soybeans are stored in a proper condition. So if there is an enough inventory from the previous year, previous crop year so this is going to be an impact on this is going to have an impact on the current year price.

Of course, other regulatory measure like Minimum Support Price announced by the Government of India and you have the weather conditions during the planting season because this is the most it is consider one of the most crucial phase of the soybean plantation, so if proper weather condition is not there so there could be severe impact on the productivity of the soybean productivity. And also another important factor which influences the price is the supply of other edible oils like palm oil, groundnut oil and sunflower oil etc. So if there is significant amount of over production or move availability of these competing products or substitutes, then price of soybean oil may take a deep.

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### Soybean, Soybean Meal and Refined Soy Oil Prices

- Stock-to use ratio: An indicator of supply. Measured by ratio of available closing stock of a commodity at the end of the crop year to total demand.
- A negative relationship between the stocks-to use ratio and the average farm price. That is, a low stocks-to-use ratio is associated with a high price and vice versa.
- Stocks-to-use ratio
- Industry Bodies
- United States Department of Agriculture
- SOPA(Soybean Processors Association) is a leading body which provides information on Soybean and other related products.
- The Solvent Extractor's Association of India  
<http://www.seaofindia.com/stats>
- Formed in 1963 . It has 875 members including about 350 working extraction plants having combined oilcake/oilseed processing annual capacity of about 30 million tonnes.



Now in this context I would like to share with respect to the availability of older inventory and its impact on the soybean prices. In this context I would like to say a ratio is called Stock to Use Ratio, so this Stock to Use Ratio is an indicator of supply, so how this Stock to Use Ratio is measured. It is a ratio measured by the available closing stock of a commodity at the

end of the crop year to the total demand. So let us say if you have X tons of closing inventory available and you have let us say average consumption is around X plus 20 tons per year so accordingly you will be able to find out what is the Stock to Use Ratio.

And what is the relationship of this Stock to Use Ratio with the next year soybean prices, so a negative relationship exists between Stock to Use Ratio and average farm price of any commodity so higher the Stock to Use Ratio will have will indicate that a next year soybean prices may go down. Now the next question arises from where are we going to get this information?

Is there some reliable source will give what is the availability of? or what is the closing inventory because this soybean can be held by different parties, maybe some are traders, some are with farmers, some maybe with major companies which are into branded soya oil production and selling, so how do we get to know about it? Of course, individually it is not feasible for us to do a survey or something like that to find out. There are certain official bodies which help us in getting information pertaining to a specific commodity. So let us identify which are the official bodies or information provider whose information can be used to formulate our views regarding a commodity price and specifically the soybean price.

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**USDA SUPPLY & DEMAND REVIEW**  
June 10, 2016  
**SOYBEANS**

**SOYBEANS:** The USDA supply/demand update for soybeans was considered bullish against trade expectations. Old crop ending stocks came in at 370 million bushels from trade expectations for 385 million bushels and from 400 million last month. Exports were revised higher by 20 million bushels due to a smaller Argentina crop. New crop ending stocks were pegged at 280 million bushels from trade expectations near 289 million bushels with a range of 215 to 350 million. World ending stocks for 2015/16 came in at 72.29 million tonnes from trade expectations for 72.73 million (74.25 million last month). Brazil production was lowered to 97 million tonnes from 98.16 million expected and 99 million last month while Argentine production came in at 56.5 million tonnes from 55.89 million expected and 56.5 million last month. World ending stocks for 2016/17 came in at 68.21 million tonnes from trade expectations for 66.67 million.

**PRICE OUTLOOK:** November soybeans traded 32 cents higher on the session just after the report. The report is supportive and leaves little room for any weather issues for the coming growing season. However, with the extreme overbought condition and a bearish weather outlook for the next 10 days, the market looks vulnerable to at least a temporary set-back. Watch for weather led

USDA SUPPLY/DEMAND US SOYBEANS		Jun 14-15	Jun 15-16	May 16-17
Area (M Acres)				
Planted		83.3	82.7	82.2
Harvested		82.6	81.8	81.4
Yield (Bu/Acre)		47.5	48.0	46.7
Beginning Stocks (M Bu)		92	191	400
Production		3,927	3,929	3,800
Imports		33	30	30
Supply, Total		4,052	4,150	4,230
Crushings		1,873	1,890	1,915
Exports		1,843	1,760	1,885
Seed		96	95	95
Residual		49	34	30
Use, Total		3,862	3,780	3,925

So let me go back to Stock to Use Ratio, so this is the, I hope you are able to see this. Let me increase the size little bit so this is the USDA supply and demand review of soybeans. So if you see this particular table to here, to the right. This is United States Department of Agriculture has as of June 2016 has given an indication what is going to be the, area of

plantation. What is the area of harvest for expected area of harvest during 16-17, May June etc.

So this, if you see if you see the Stock to Use Ratio is, Stock to Use Ratio is 4\$9% during June 14-15. It has gone up to 9\$87% during June 15-16 and it is expected to be around 7\$8% in May 16-17 and it is expected to by June 16-17 it is going to be around 6\$6%. So this an indication, going by this mere indication we can say that during the crop year of 16-17 the price may fall down considering the Stock to Use Ratio.

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USDA Stock to Use Ratio and Supply/Demand Report for World Soybeans				
	Jun USDA 14-15	Jun USDA 15-16	May USDA 16-17	Jun USDA 16-17
Supply, Total	4,052	4,150	4,230	4,200
Crushings	1,873	1,890	1,915	1,915
Exports	1,843	1,760	1,885	1,900
Seed	96	95	95	95
Residual	49	34	30	30
Use, Total	3,862	3,780	3,925	3,940
Ending Stocks	191	370	305	260
Stocks/Use Ratio	4.9%	9.8%	7.8%	6.6%

USDA SUPPLY/DEMAND WORLD SOYBEANS (Million Metric Tons)				
	Jun USDA 14-15	Jun USDA 15-16	May USDA 16-17	Jun USDA 16-17
Supply				
Beginning Stocks	62.03	76.30	74.25	72.29
Production	319.73	313.26	324.20	323.70
Imports	123.51	130.78	136.02	136.02
Use				
Crush, Domestic	263.26	279.33	288.39	288.44
Total Domestic	300.82	318.01	327.96	327.99
Exports	128.15	132.04	138.31	137.71
Ending Stocks	78.30	72.29	68.21	66.31
Stocks/Use Ratio	26.0%	22.7%	20.8%	20.2%

Now let's go to the Stock to Use Ratio as given by the USDA for the world soybean. So Stock to Use Ratio is 26% 22\$7%, 20%, 20\$8% and 20\$2% respectively. So accordingly you will be able to, if you spend some time you will be able to formulate your views about the likelihood of soybean prices going up or going down by considering these various parameters.

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### Soybean, Soybean Meal and Refined Soy Oil Prices

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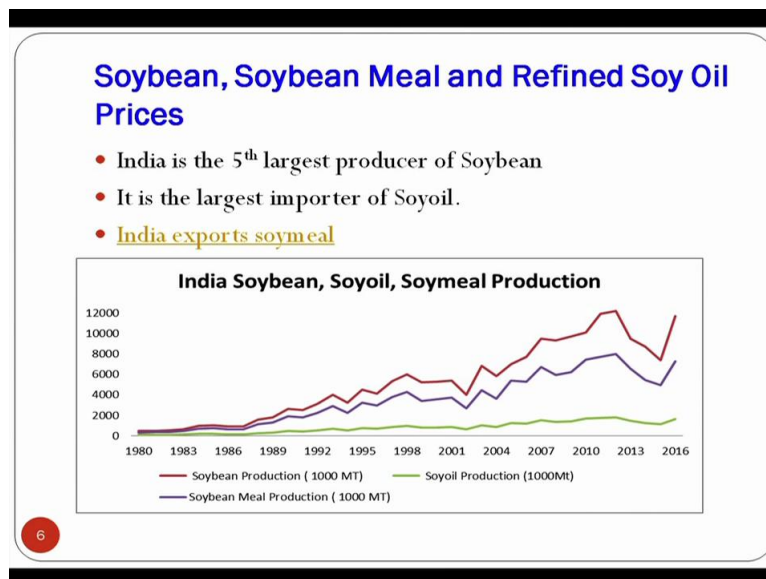
Now if the commodity has its own industrial bodies and cooperative societies, which provide very authentic information. Okay now the next question is that from where do we get authentic information pertaining to a commodity? So for soybean there are some sources, so what are, which are these sources, United States of Department of Agriculture provides a lot of timely information pertaining to many agricultural products which are produced and consumed all over the world.

So that is an important source where you will be able to get information pertaining to that commodity which you are considering and specifically for soybean in India, you have two bodies called SOPA and Solvent Extractors' Association of India. So SOPA stands for Soybean Processors Association of India and it is a leading body which provides information pertaining to acreage of plantation under soybean, who are the processors? What are the what is the old stock available? What are the prices prevailing in the different markets?

Besides Indore or including Indore so there are other markets, major markets for soybean that information is also available at this websites of a SOPA. There is also another website or information source which is known as the known as the Solvent Extractors Association of India and the website link which I have given it is very old body which is formulated in the year 1963 and it has around 875 members and out of which 315 members are involved in solvent extraction plants, so 350 members own solvent subtraction plants. And with the combined oil cake and oil seed processing capacity annual capacity of about 30 million tons. So this processing, these processors not only process soya bean they also process rice bran.

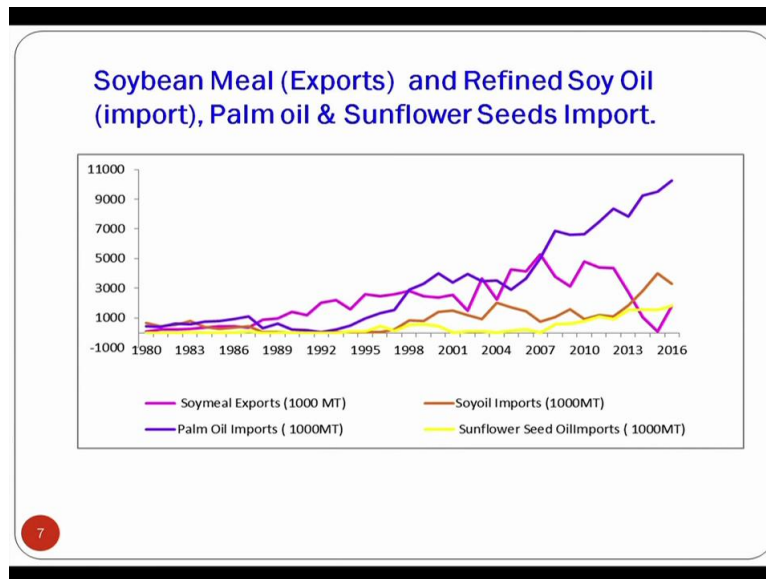
They also process castor oil and sesame seed, coconut and mustard etcetera, so these processor, the solvent extractor use the raw material and extra the oil from the extraction process. So as far as Soya bean is concerned beside many government of India publication by ministry of agriculture you can you can, keep track of whatever information is providing by these two leading bodies called SOPA and solvent extractors of India.

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And of course USDA is another authentic source of our getting some information, pertaining into a Agri-commodity. Now I will just take you quickly what has been the price of Indian soya bean, soya oil, and soya milk production. If you see this is this is the quantum of production, it is not prices it is quantum or production of Indian soya bean and soya oil production. So this is in thousand metric ton and India is the, as I mentioned the 5<sup>th</sup> largest producer of soya bean but it is the largest importer of soya oil, and it is also, exports soya meal because India's soya meal is considered to be very good quality because India still does not produce or India is still producing non-GMO variety of Soya meal and so India's soya meal is considered premium in many markets.

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This particular diagram also shows the import export of soya meal and refined soya oil as well as palm oil and sunflower seed import so please spend some time, I am not going into much detail into it. But cursorily you can see that soya meal exports are going down because our domestic consumption is increasing as well as global prices have gone down and India's soya meal prices are increasingly becoming little expensive so that there is a reason why not much of soya meal has been exported since last couple of years. Soya oil import as I said, soya oil import is increasing and increasing the way we are eating or using the edible oil considering the obesity of among Indian men and women.

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**Hedging Soy Complex Price Risk**

- A branded soyoil manufacturer buys soybean, extracts and sells soyoil and soymeal. It has already entered into selling soymeal to a animal feed manufacturer at a fixed price.
- Due to low production in Indian Soybean, soybean price is increasing. India's policy also restricts import of GM (Soybean)
- The company can not increase the price of its own brand of soyoil
  - due to higher competition in branded edible oil market.
  - due to higher production of Palm oil and relatively easy import norms for edible oil import to India, the company is fearing the edible oil spot price may go down.
- Unless the company does something, it will end up incurring loss as its margin is getting squeezed.

8

So this trend is going to continue for some time to come till we produce, we become self sufficient in production of soya oil and accordingly we are also importing palm oil and soya, sunflower seed. Now how do we suppose, based on this information, you decide to take you are interested to you are interested take a futures position on soya, on different soya products like your soya bean, soya oil and soya meal. So how will you go about it?

Let me give an example real life example. Let us say a branded soya oil manufacturer buys soya bean from the market, he does not own, I mean, buys soya oil, soya bean from farmers extracts and sells soya oil and soya meal. You have already entered into selling soya meal to a animal feed manufacturer in India at a fixed price and due to low production of Indian soya bean, so soya bean prices is increasing and India also has a policy related to restriction of imported of genetically modified soya bean. So this company is not accepting any sort, shuffling of soya bean prices in near future, but it has already committed to sell soya meal at a fixed price.

Also the company which is into manufacturing and selling of branded soya oil, it cannot increase the soya oil price because it is also facing steep competition from other branded soya oil in marketers in India and it will also not be able to increase the soya oil price in India because the global price of palm oil and the easy import of norms of edible oil into India is will ensure that it does not have the freedom to increase the soya oil price.

Now, what the company will do? So, if the company does not do anything it will end up buying soya bean at a higher price. It will not be able to increase its soya oil prices and it will be, it will not be able to get higher price for its soya meal because it has already entered into a fixed priced contract for delivering the soya meal at a fixed price. So in that case what is going to be the strategy of this particular company? How this company will be able to mitigate the risk, this aspect we will discuss in the next session, Thank you all of you.