APEDA Agri Exchange

Ready Reckoner SERIES

Commodity: GUARGUM

Report as on:

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Prepared by:

agriexchange.apeda.gov.in

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1. Introduction

1.1. Guar Gum History

Guar is a native to the Indian subcontinent. Guar is grown mainly in India, Pakistan, United States and also in some part of Africa and Australia.

In old times, Guar was only used as rich protein to feed cattle. It is also used as green vegetable in India. After Second World War there was major shortage of locust bean gum which adversely affected the textile and paper industries. At that time Guar Gum was found as the most suitable substitute for scarce locust bean gum. In 1953 the extraction technology of guar gum was commercialized in USA and India after decade of period.

1.2. Guar Plant

The guar plant is an annual plant known as 'Cyamopsis Tetragonaloba'. The important source of nutrition to human and animals is the legume, it regenerates soil nitrogen and the endosperm of guar seed is an important hydrocolloid widely used across a broad spectrum of industries.

The guar plant flourishes in extremely drought resistant and semiarid regions where most plants perish. It grows best in sandy soils. **The ideal areas for farming are West, Northwest India** and parts of Pakistan**.** The major processing centers of Guar Gum are in the North Western states in India.

The guar plant grows from 2 feet to 9 feet high. The plant's flower buds start out white and change to a light pink as the flower opens. The flowers turn deep purple and are followed by fleshy seed pods which ripen and harvested in summer.

The seed pods grow in clusters giving guar the common name cluster-bean. A gum extracted from the guar beans forms a gel in water, commonly referred to as guar gum. Guar is extremely drought

resistant and thrives in semi-arid regions where few plants thrive. When limited moisture is available the plant will stop growing but does not die. Guar gum is also known as guarkernmehl, guaran, goma guar, gomme guar and galactomannan.

2. Guar gum

Guar gum, also called guaran, is a galactomannan.. Guar gum is an extract of the guar bean, where it acts as a food and water store. The guar bean is principally grown in India and Pakistan, with smaller crops grown in the U.S., Australia, China, and Africa. The drought-resistant guar bean can be eaten as a green bean, fed to cattle, or used in green manure. The guar seeds are dehusked, milled and screened to obtain the guar gum. It is typically produced as a free-flowing, pale, off-white colored, coarse to fine ground powder. Indeed Guar is vegetable, India is native of guar or cluster bean where it is used as a vegetable. For hundreds of years Guar has been used as vegetable in India. It is also used as a cattle food, and as a green manure crop in agriculture.

Guar gum comes from the endosperm of the seed of the legume plant Cyamopsis tetragonoloba; an annual plant, grown in dry regions of India as a food crop for animals. There are various grades of Guar gums pure or derivative. Guar gum is a white to creamy colored, free flowing powder and free from extraneous matter. Its ability to suspend solids, bind water by hydrogen bonding, control the viscosity of aqueous solutions, form strong tough films have accounted for its rapid growth and use in various

industries. For example guar gum is used in paper, textile, oil drilling, mining, explosives, ore flotation and other various industrial applications.

2.1. Guar harvesting period

A growing season of guar is 14 to 16 weeks and requires reasonably warm weather and moderate flashing rainfall with plenty of sunshine. Too much rain can cause the plant to become more 'leafy' resulting thereby reducing the number of pods or the number of seeds per pod which affects the size and yield of seeds. The crop is generally sown after the monsoon rainfall in the second half of July to early August and is harvested in late October early November. The Guar is a naturally rain fed crop. Depending on the monsoon rainfall the total size of Guar crop varies from year to year. After harvesting, when the pods become dry through sunlight, they are beaten off and during this process, the seeds come out of the pods.

2.2. Seasonality

The seed is normally sown during the second half of July to August after the monsoon rainfall starts, and harvested during October and November. The crop requires 3-4 spells of rain during seed setting and maturing, which is during September first week and the end of September.

Sowing			**Crop growth**			**Peak arrivals**			**Lean arrivals**		
Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May

2.3. Areas of Cultivation:

Guar is a crop of semi arid–sub tropical areas spread over the North and North West of India and East and South East of Pakistan. Guar is grown in arid zones of Rajasthan, some parts of Gujarat, Harayana, Madhya Pradesh. Jodhpur City in the North Western state of Rajasthan in India is the most important processing centre of Guar Gum and contributes approximately 40% of the world' s Guar Gum supply.

This crop is a drought-tolerant, warm-weather, deep-rooted summer-growing annual legume. It grows well in soils of low fertility in the arid and semi-arid areas of the tropics and subtropics where the rainfall is summer-dominant.

The main areas of cultivation of Guargum in India are Rajasthan, Gujarat, Haryana , Punjab , Uttar Pradesh , Madhya Pradesh , Tamil Nadu , Maharashtra , Karnataka , Andhra Pradesh

2.4 Varieties

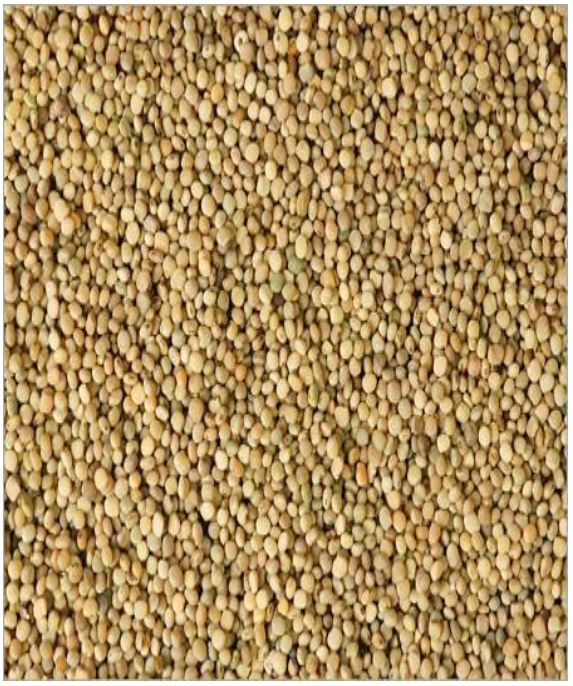
1) Hydroxy Alkylated Guar gum
2) Carboxy Methylated Guar gum
3) Oxidised Guar gum
4) Acetates of Guar gum
5) Cationic derivatives of Guar gum
6) Sulphated Guar gum
7) Guar gum formate
8) Guar gum acryl amide
9) Borate cross linked Guar gum
10) Reticulated Guar gum

Power Guar Meal

At very low concentration, Guar gum has excellent settling flocculation properties and it acts as a filter aid. Guar gum powder has strong hydrogen bonding properties absence

Guar Meal

Guar Meal is a highest protien containing animal feed in this group. It is having up to 55% of protien with a digesting content, which improves digesting system of animal and also improve milk quantity



Guar Seed

Guar Gum Split

3. Guargum Production

Production of Guar in India

Guar seed is a monsoon crop and further require dry weather for better production. The annual production is related to rainfall. The production will be higher if the crop receives good rainfall and will result in decline in prices. From the year 2005 the availability of rainfall was steady which maintained the production of crop in a range bound. Accordingly the price of gaur seed was also steady from the year 2005 till 2008. And in 2009-2010 the production was 3.5 lakh tons due to unfavorable rainfall and the price hit all time high in the spot and futures market. During that season (2009-2010) the farmers shifted to profitable crops as the availability of rain was only 392.1MM. But this year the overall fundamentals are favorable for guar seed productions and have received 688.2 MM rain. The output is estimated to increase in this fiscal year at around 10 lakh bags against 3.5 lakh bags in 2009-2010.

India produces 600000 lakh tons of guar annually i.e. the maximum level of production in the world. It contributes to around 80% share in the world's total production. The major producing regions of this crop in India are

India produces 600000 lakh tons of guar annually i.e. the maximum level of production in the world. It contributes to around 80% share in the world's total production. The major producing regions of this crop in India are

1) Rajasthan
2) Gujarat
3) Haryana
4) Punjab
5) Uttar Pradesh
6) Madhya Pradesh
7) Tamil Nadu
8) Maharashtra
9) Karnataka
10) Andhra Pradesh

Rajasthan can be termed as the largest guar producing state in the world as it dominates the Indian production scenario contributing to around 420000 tons of this crop i.e. over 70% of the total production in India. Haryana and Gujarat place themselves at the second and third positions regarding the production in India with 12% and 11% respectively. In Rajasthan, the districts where guar production is done are Churu, Bikaner, Jaisalmer, Barmer, Nagaur, Hanuman Garh, Jodhpur, Ganganagar, Jaipur, Sirohi, Dausa, Jhunjhunu and Sikar. The districts in Haryana indulged in the production of guar are Bhiwani, Gurgaon, Mahendragrh and Rewari and the districts in Gujarat are Kutch, Banaskantha, Mehsana, Sabarkantha, Vadodara and Ahmedabad.

Indian Guar Production

India is the largest producer of guar seed and accounts for around 75-80 per cent of the total guar produced in the world. Rajasthan accounts for 65-70 per cent of India's production. The other producers are Gujarat, Haryana, Punjab, Uttar Pradesh and Madhya Pradesh. The average production of guar seed in India is 7-8 lakh tonnes and it fluctuates largely based on rainfall pattern. Like the year 2002-03 was marked by a low production to the tune of mere 40,000 tonnes due to severe drought, whereas in 2003-04 the production climbed to astronomical high levels of 16 lakh tones on increased acreage and good rainfall. The total annual production for the year

2006-07 was around 7-7.5 lakh tones as per trade estimates. The guar seed production is expected to remain almost steady in the range of 7.5-8.0 lakh tones in 2007-2008 as increased production in Haryana and Northern Rajasthan is nullified by declined production in Central and Western Rajasthan. Out of the total production of around 2.3 lakh tonnes of guar gum in the country, around 30,000 tonnes is consumed in the domestic market and around 2.0 lakh tonnes exported.

India is the leading exporter of guar seeds and guar gum. The major importing countries of Indian guar products are E.U, United States of America, China, United Kingdom, South Africa, and Japan. In 2005-06, the top importing countries were U.S with 75,000 tonnes, China with 27,000 tonnes, Germany with 17,700 tonnes, Italy with 4,500 tonnes and Netherlands with 4,500 tonnes. The country exported about 2,05,000 tonnes of guar gum during the year 2006-07 as compared to 1,86,000 tonnes in 2005-06. The exports are expected to climb slightly higher to 2,10,000 tonnes in 2007-08 as production in Pakistan is expected lower this year.

Year	Area ('000 Ha)	Rajasthan Production (Lakh Tonnes)	Yield (Kg/Ha)	Total Production (Lakh Tonnes)
1999-00	2,648.5	2.32 (70%)	87	3.3
2000-01	3,056.3	4.81 (69.7%)	157	6.9
2001-02	2,412.6	7.63 (70%)	316	10.9
2002-03	556.5	0.28 (70%)	50	0.4
2003-04	2,278.3	11.63 (70%)	511	16.6
2004-05	2,363.8	3.44 (70.2%)	146	4.9
2005-06	1,264.6	3.12 (56.7%)	246	5.5

2006-07	2,810.0	5.10* (72%)	181*	7-7.5*
2007-08	2,300.0	5.00* (65%)	217*	7.5-8.0*

Source: Department of Agriculture, Rajasthan and NABARD

*Trade Estimates

Major markets of Guar seed:

Ganga Nagar, Hissar, Alwar, Sirsa, Jodhpur, Bikaner, Jaipur are the major markets for Guar seed.

3.1 Major producing states of Guargum

3.1 (a) Rajasthan

Production of guarseed in Rajasthan, the main producing area is expected to be nearly 70 lakh bags this year. In Shri Ganganagar and Hanumangarh districts, total production of guar is expected to be nearly 23-25 lakh bags based on the latest sowing figures from traders. If rains occur there in the coming days, production may increase. In Bikaner, around 3 lakh bags production is expected. Though sowing has increased in Churu district, but in Nagaur, Pali and Sirohi, sowing level has fallen as farmers are taking interest in production of castor seed and Moong instead of guarseed in the wake of better price realizations of these products. Sowing is reportedly same in Jodhpur while sowing has increased in Barhmer and Jaisalmer. Moreover, reports indicate no change in sowing levels in Alwar, Bhartpur, Jaipur, Sikar, Ajmer, Chittorgarh and Udaipur districts.

Though production is expected at ~70 lakh bags in Rajasthan, but sowing work started late owing to late arrival of monsoon. Again, more rains are needed in the growing areas. First spell of rains was satisfactory but another spell of rains is needed. If rains do not occur in next few days, colour of the crop would start to fade. News related to colour deterioration is already there from some places. If this turns out to be true, size of guar plant would reduced, which may cause the production to fall to ~50 lakh bags from the current estimates of 70 lakh bags.

3.1 (b) Haryana

Haryana is the second largest producer state of guarseed where ~30 lakh bags guar is produced. Though timely arrival of monsoon paved the way for satisfactory sowing, but excess rains and floods last month damaged the crop to some extent. Here also, rains are needed within next 1 week in producing areas - otherwise production may reduce by 5-7 lakh bags.

3.1(c) Gujarat

Sowing has not been done in many places of Gujarat due to late arrival of monsoon which have resulted in low sowing figures. Moreover, farmers took interest in sowing of other commodities like castor seed instead of guar as they are fetching better price. At present, Castor seed is fetching Rs 3000/Q while guar seed which is available at Rs 1400/Q. Rains are needed here also. If rains do not occur here within next few days, production is apprehended to reduce to below 2 lakh bags.

3.1 (d) Other producing states

Sowing in Punjab is done in Abohar and Firozpur. Flood and excess rains have resulted in reduced production below 1.50 lakh bags whereas earlier, it was expected to remain near 2 lakh bags. Production in MP and AP is expected to remain at around 2 lakh bags.

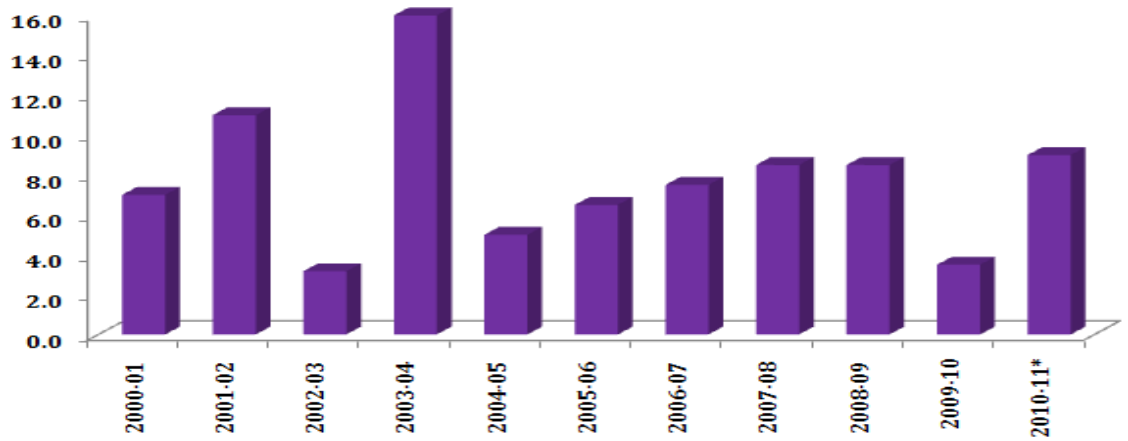
Earlier, there had been expectations of increased production of more than 1 Crore bags. Increased area of sowing and good and timely rains in some growing areas had been the main factors. However, delayed rains in some areas and excess rains and floods in places like Gujarat have now reduced the hope for good production. As of now, production is expected to be less than 1cr bags.

Moreover, crop is facing disease related problem and the only remedy is occurrence of rains over Rajasthan, Haryana and Gujarat soon. As per traders, if it rains within next few days, production may touch the level of nearly 1 crore bags. Otherwise, it may fall to less than 70 lakh bags. There are expectations of rains in the coming days – as per different weather forecasts. The short term and medium term trend for guarseed price would depend totally on the production factor – which in turn would depend on the rains.

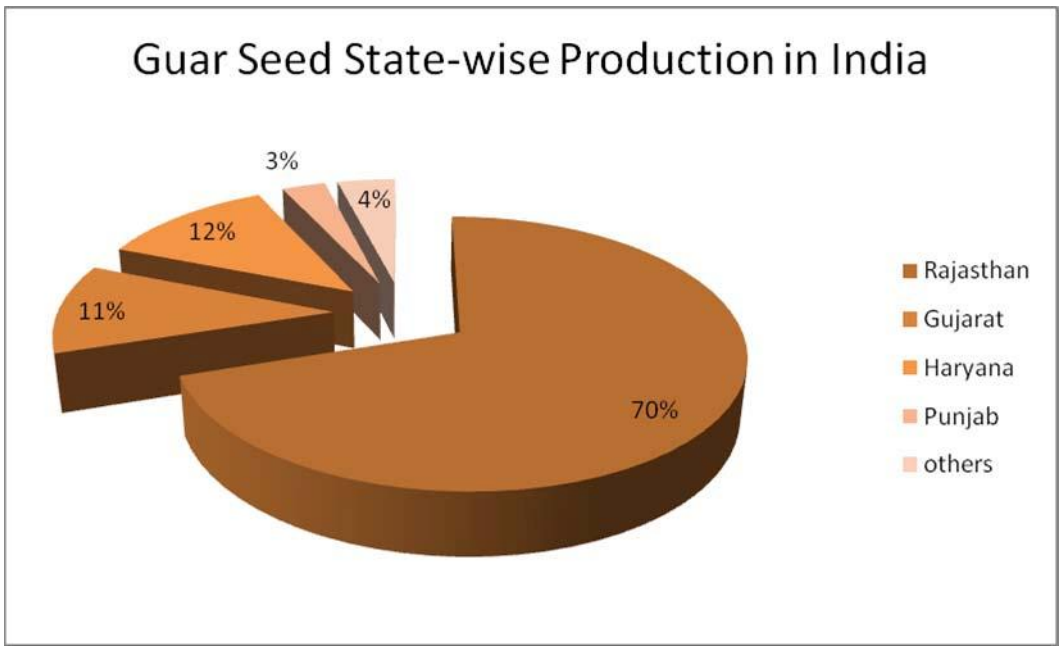
3.2 Indian Scenario

India contributes about 80% to the world guar production and Pakistan is the second largest pro- ducer. Guar is a rain-fed kharif crop which is sown in June-July and harvested in October- Novem- ber. The major growing areas in India are Rajasthan, Haryana and Gujarat. Rajasthan is the largest guar producing state in the India with a dominant share of nearly 80% in the production. Haryana and Gujarat contribute 12% and 11% respectively to the guar production in India. The rainfall during the south west monsoon last year was much lower than the normal which was a serious draw back to the guar crop prospects. The yield levels were declined sharply as the rainfall was insufficient at critical growth stages. This resulted in sharp decline in the yield levels in the year 2009. As a result of unfavorable weather condition, India's guar production fell 60% to 3.5 lakh tons. In 2010, good south west monsoon rains supported the increase in acreage and doubled the production estimates compared to 2009.

3.3 Guar gum seed Production Trend



3.4 State wise Production Chart of Guar Seed

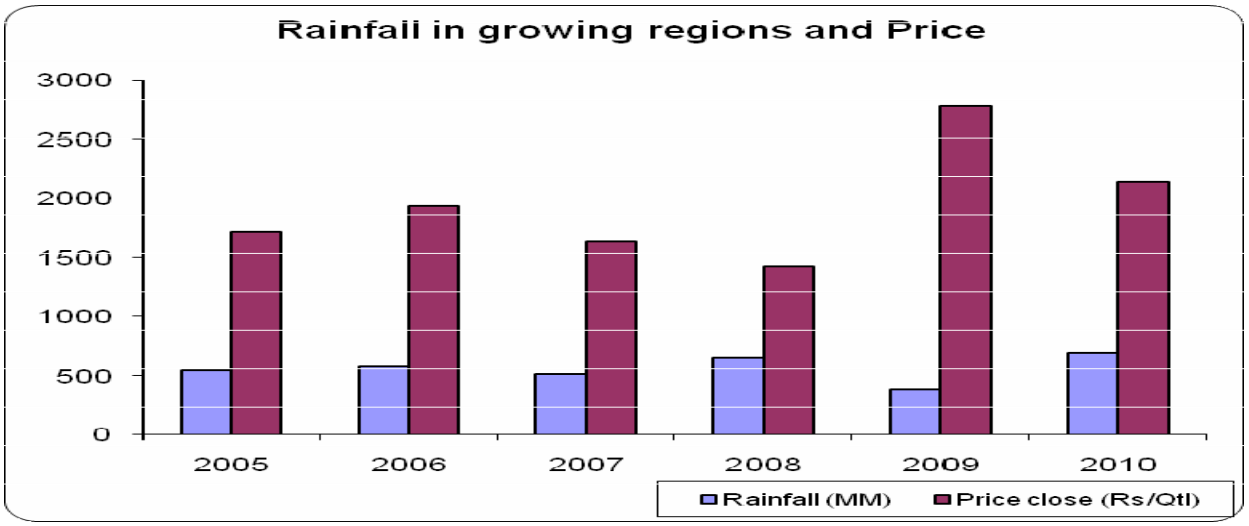


Source: Market data

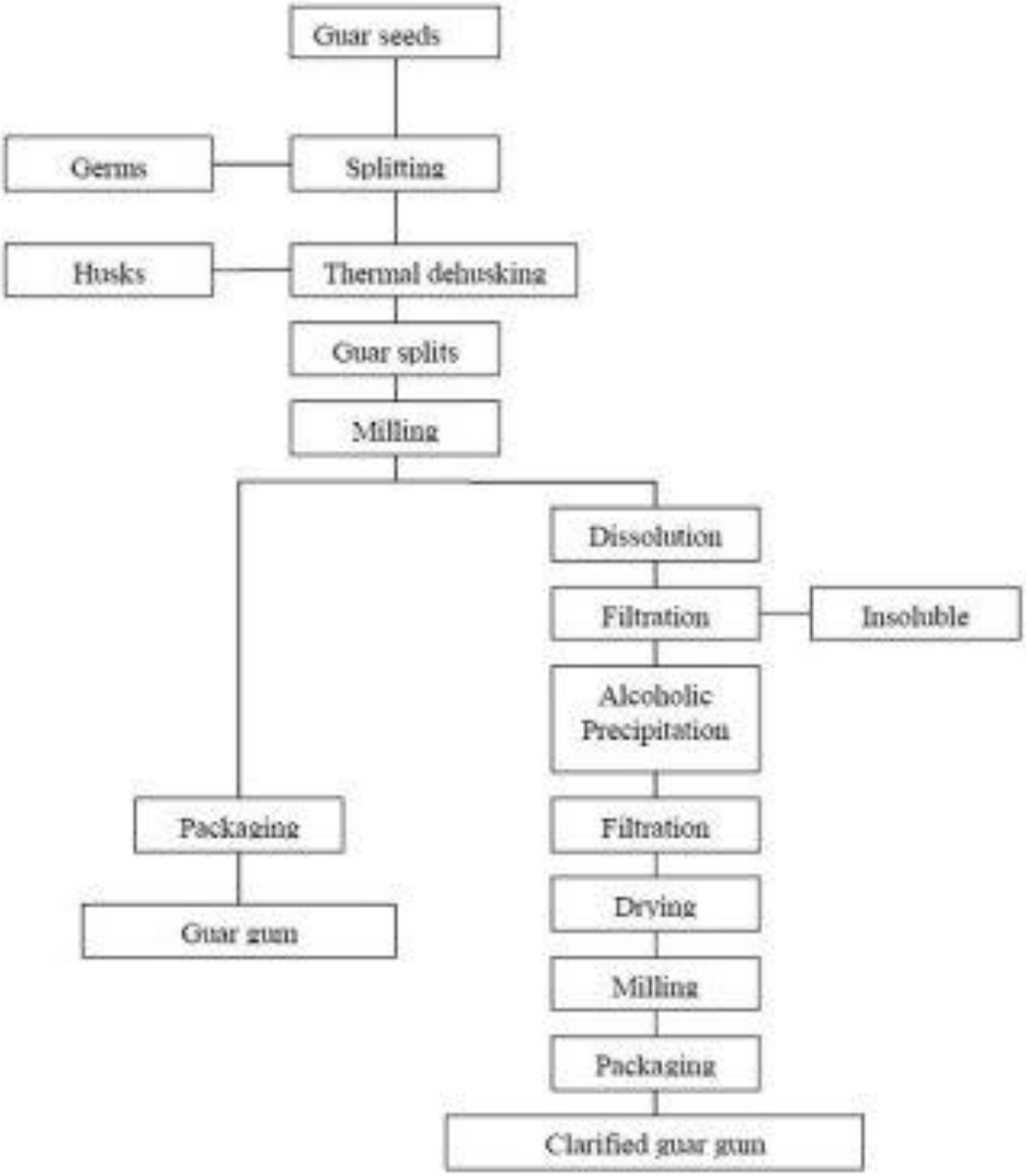
3.5 Indian Guar Market

- India has been a major player in the context of guar and guar gum in the global market.
- India's production contributes to 80% of the world's total production figuring up to 6 lakh tons.
- Rajasthan wholly retains the credit for India's position producing 70% of the production itself.
- Guar is largely consumed as a vegetable in the Indian subcontinent. It is also used in making pickles.
- 25000 tons of the total production in the country constitutes to the domestic market.
- Guar gum has a vast range of industrial applications and the major share of demand comes from various industrial sectors only.
- India is the leading net exporter of guar seeds and guar gum. The country exports over 117000 tons of guar and its derivatives, which is comprised by 33000 tons of refined split guar gum, and 84000 tons of treated and pulverized guar gum.
- The net worth of the Indian exports is estimated over Rs 500 crores.
- The production list of guar is dominated by India as a leading producer of this crop. The consumption pattern of guar seeds is largely influenced by the demands from the petroleum industry of United States of America and the oil fields in the Middle East as the derivative products of these seeds are quite useful in the petroleum drilling industries.
- United States alone constitute to around 40 thousand tons of guar and its derivatives demand.

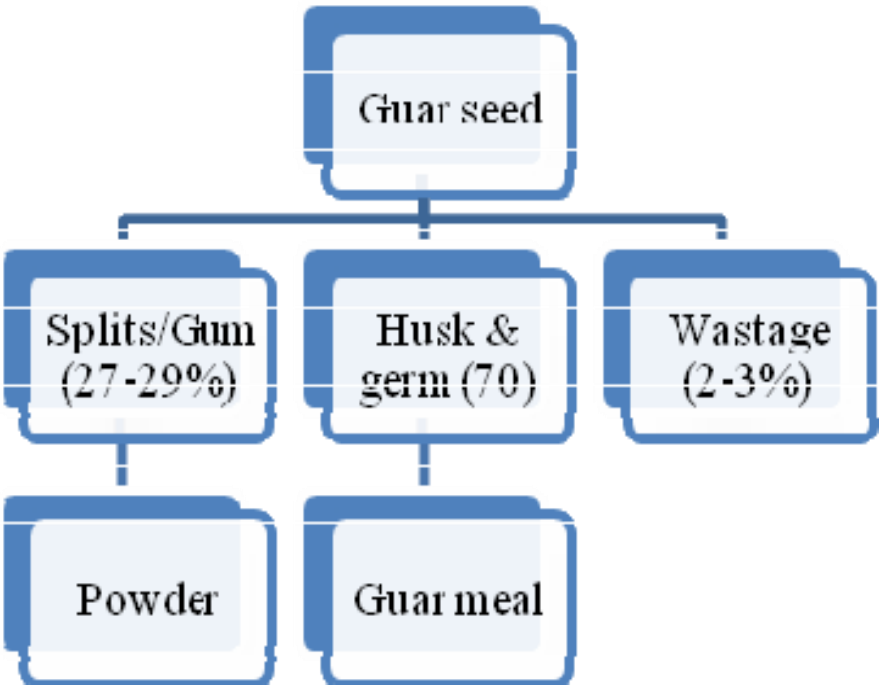
Also, in rest of the world, the trend of consumption has increased with time that has lead to the introduction of this crop in many countries


Rainfall in growing regions and Price
3000
2500
2000
1500
1000
500
0
2005
2006
2007
2008
2009
2010
Rainfall (MM)
Price close (Rs/Qtl)

4. Guargum Making Flow Chart



5. Processing Flow Chart



5.1 Undehusked Guar Splits

- The gum is commercially extracted from the seeds essentially by a mechanical process of roasting, differential attrition, sieving and polishing.
- The seeds are broken and the germ is separated from the endosperm.
- Two halves of the endosperm are obtained from each seed and are known as Undehusked Guar Splits.

5.2 Refined Guar Splits

- Refined Guar Splits are obtained when the fine layer of fibrous material, which forms the husk, is removed and separated from the endosperm halves by polishing.

5.3 Guar Powder

- The refined Guar Splits are then treated and finished into powders by a variety of routes and processing techniques depending upon the end product

5.4 Guar seed Extract

Guar seed consists of three parts, germ (43-47%), endosperm (35-42%) and the husk (1 17%). Extracts from Guar seed include Guar Split/Gum (29%), Korma (30-35%) and Churi (35-40%). Guar split/gum is further refined to Guar powder. The by-product of Guar Gum industry consisting of the outer seed coat and germ material is called guar meal. The Guar meal after gum Extraction is a potential source of protein and contains about 42% crude protein, which is one and a half times more than the level of protein in guar seed.

5.5 Guar gum & Splits

Approximately 90% of total Guar produce is used for production of Guar Gum and rest is used for culinary purposes and cattle feed etc. Guar gum, also called guaran, is a galactomanan. Guar gum is produced from the endosperm, which is about 35-42 percent of the guar seed mass, and mainly consists of gum Poly groups of monogalactoses (a type of sugar). Different grades are made based on purity and present viscosity of powers in water. Guar gum has almost 8 times the thickening power as corn starch, and is used in dressings, sauces, milk products, and baking mixes.

5.5. (a) Specifications of Guar Splits:

Attribute	Specification
Gum Content	80-85%
Dehusked Splits	90% Minimum
Protein	5% Maximum

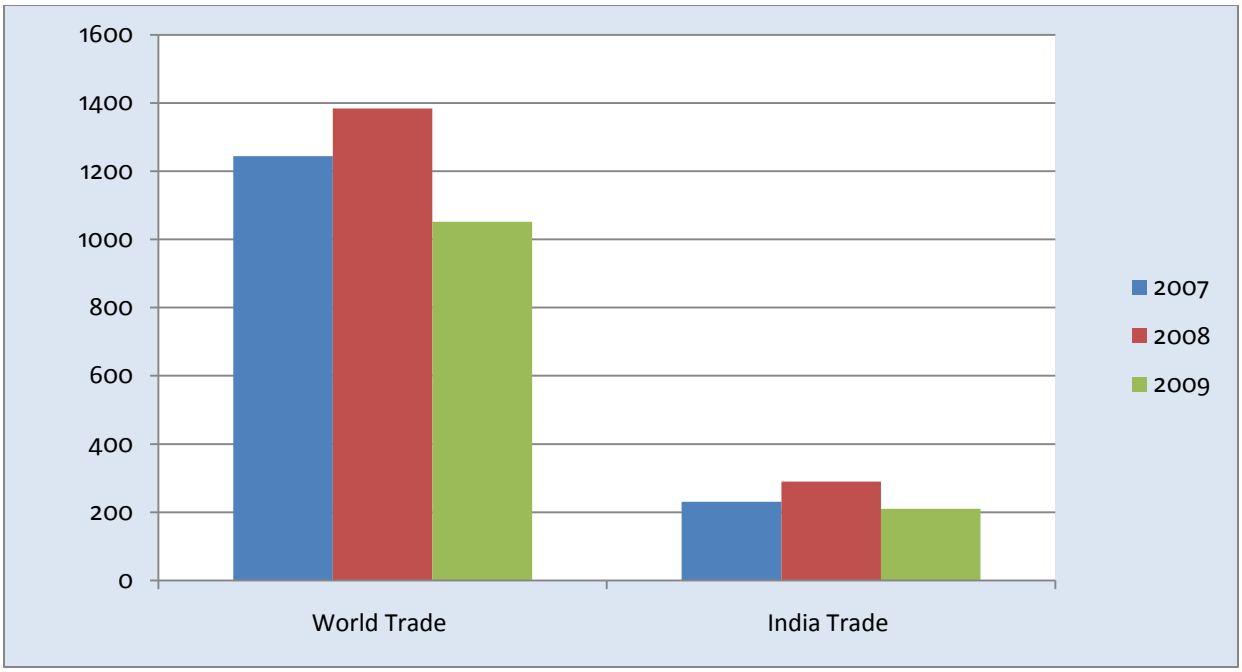
Ether Extract	0.6% Maximum
Ash	1% Maximum
Moisture	10% Maximum
Crude Fibre	1.5% Maximum
Degree of refining	Double refined

6 .Guar Gum Value Chain

7. Guargum Statistics

7.1 Global Trade of Guargum & India % Share in Global Trade

Value in US $ Mill

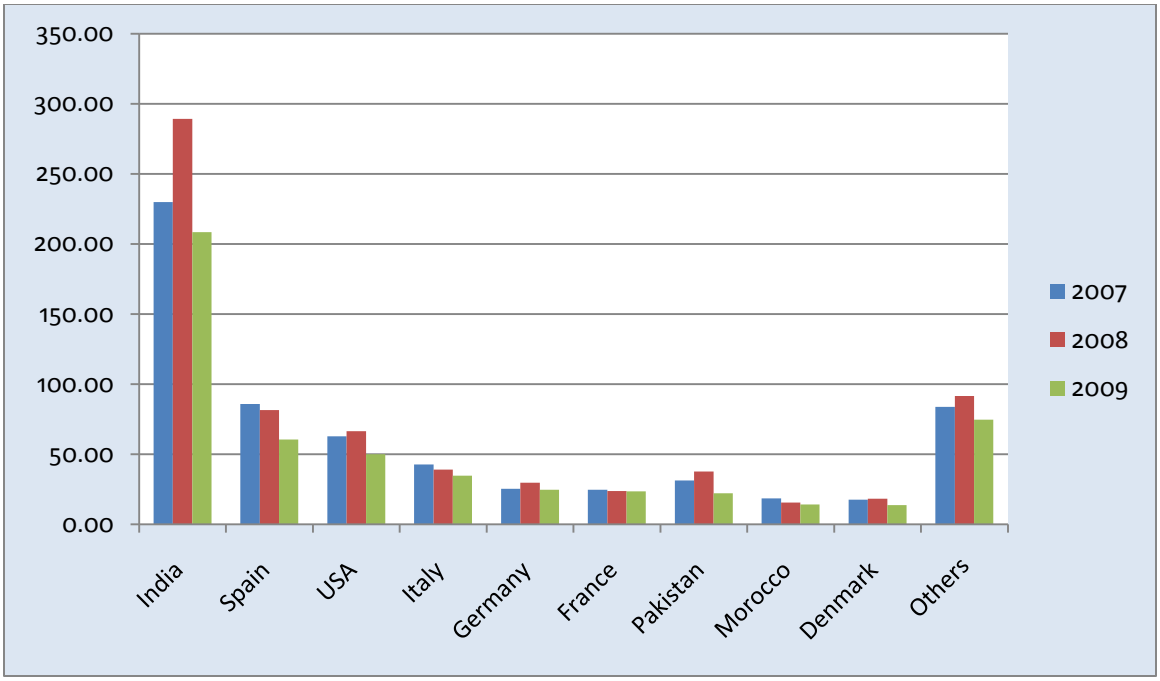


Global Trade of Guargum and India % Share

year	India Trade		World Trade		India % Share
	Net weight (Mt)	Value US $ Mill	Net weight (KG)	Value US $ Mill	
2009	153398.67	210.29	449926.98	1052.47	19.98
2008	92966.66	290.90	348814.96	1384.60	21
2007	145138.49	231.00	459396.54	1244.22	18.57

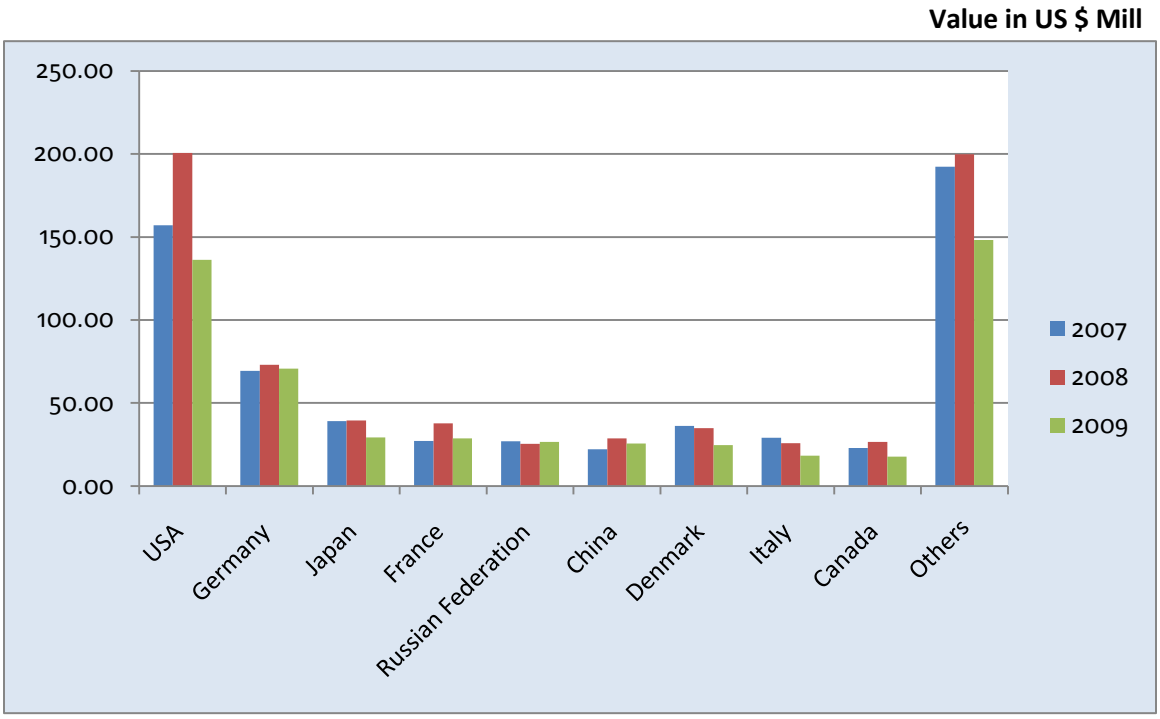
7.2 Major Exporting Countries of Guargum

Value in US $ Mill



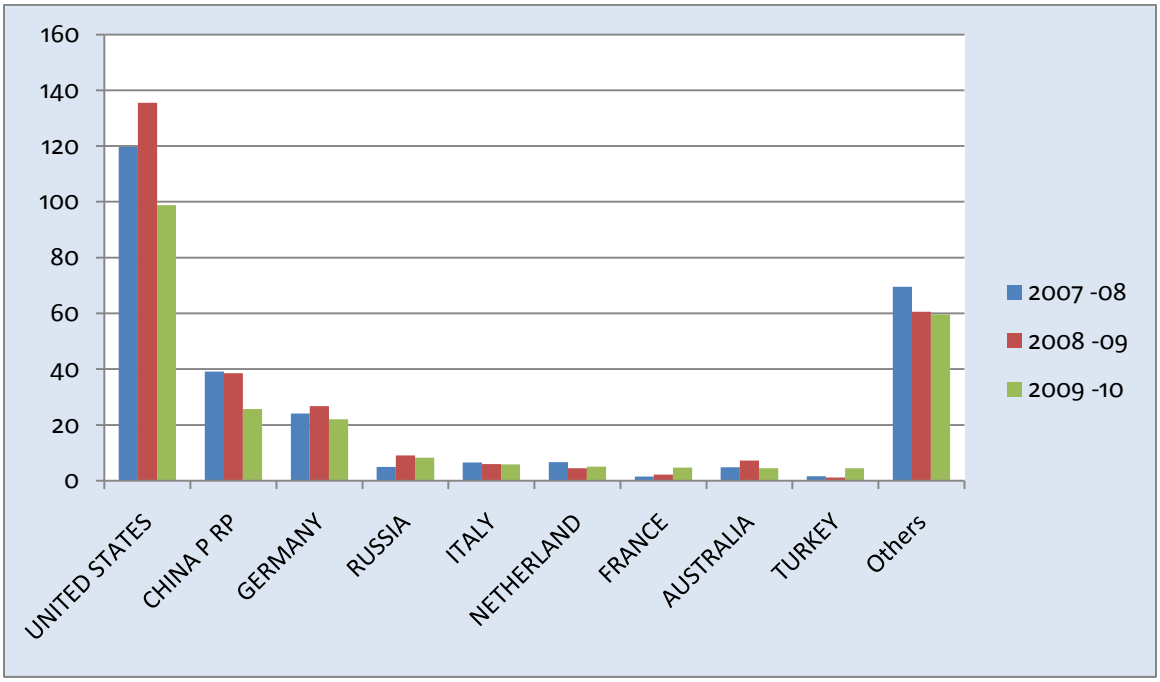
	2007		2008		2009	
Exporting Country	Qty(Mt)	Val US$ Mill	Qty(Mt)	Val US$ Mill	Qty(Mt)	Val US$ Mill
India	144929.54	229.77	92700.76	289.29	153124.66	208.37
Spain	8292.86	85.89	6600.13	81.42	6826.68	60.47
USA	16046.37	62.71	17434.06	66.30	11081.68	50.01
Italy	6619.94	42.58	5141.70	39.02	4976.21	34.65
Germany	9038.52	25.40	11353.27	29.66	9761.36	24.62
France	2622.80	24.67	2493.06	23.77	2697.46	23.40
Pakistan	22937.28	31.32	18962.26	37.65	18512.89	22.17
Morocco	1284.55	18.36	983.23	15.37	1300.08	14.09
Denmark	1555.09	17.45	1505.88	18.17	1222.40	13.73
Other Country	16199.37	83.78	17145.81	91.59	15437.54	74.61
Total	**229526.31**	**621.92**	**174320.16**	**692.24**	**224940.95**	**526.13**

7.3 Major Importing Countries of Guargum



	2007		2008		2009	
Importing Country	Qty(Mt)	Val US$ Mill	Qty(Mt)	Val US$ Mill	Qty(Mt)	Val US$ Mill
USA	75510.89	157.03	0.00	200.63	71407.15	136.28
Germany	27539.10	69.30	30596.50	73.06	31984.55	70.80
Japan	7571.59	39.13	7421.46	39.59	6381.67	29.19
France	5257.30	27.10	9967.40	37.79	7589.40	28.79
Russian Federation	14889.89	27.05	19445.38	25.41	14235.02	26.65
China	11048.97	22.16	14398.80	28.67	15798.80	25.68
Denmark	5775.97	36.24	5266.75	34.87	4587.10	24.63
Italy	9897.02	29.14	9081.84	25.90	11210.48	18.35
Canada	7692.87	22.88	9420.18	26.67	5631.73	17.80
Others	64686.64	192.27	68896.48	199.78	56160.15	148.18
Total	229870.23	622.30	174494.80	692.37	224986.03	526.35

7.4 Major Destination of Indian Guargum



7.5 India Export Statistics

	2007-2008		2008-2009		2009-2010	
Country	Qty(Mt)	Val US$ Mill	Qty(Mt)	Val US$ Mill	Qty(Mt)	Val US$ Mill
UNITED STATES	81774.56	119.66	97149.28	135.47	71922.86	98.83
CHINA P RP	34298.99	39.07	39225.76	38.5	25261.49	25.74
GERMANY	17899.67	24.05	22509.03	26.69	20598.92	21.97
RUSSIA	3805.09	4.9	6692.98	9.08	6100.98	8.26
ITALY	4896.89	6.56	5904.97	5.92	6754.81	5.87
NETHERLAND	4439.48	6.64	3862.24	4.47	3361.7	5.07
FRANCE	1037.45	1.48	1492.07	2.18	2872.91	4.69
AUSTRALIA	3858.67	4.81	6534.38	7.18	4039.48	4.5
TURKEY	1089.5	1.56	1480.91	1.08	10701.58	4.46
Others	58062.28	69.52	73711.65	60.57	66843.81	59.68
Total	211162.58	278.25	258563.27	291.14	218458.54	239.07

8. Current Markets of India

8.1 India Export of Guargum to ASEAN

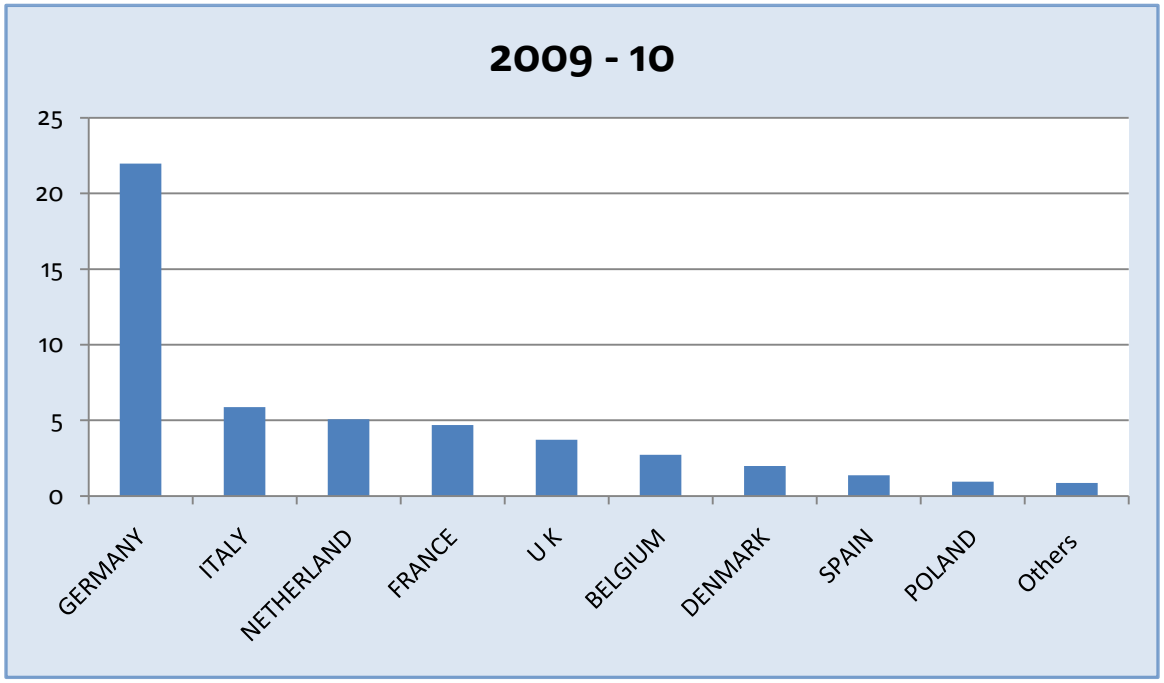
Value in US $ Mill

India Export Statistics

	2009-2010	
Country	**Qty(MT)**	**Val in US $ Mill.**
MALAYSIA	8203.59	2.59
VIETNAM SOC REP	8060.92	2.53
INDONESIA	2140.97	2.23
THAILAND	2279.85	1.78
PHILIPPINES	4392.56	1.77
SINGAPORE	203.91	0.24
BRUNEI	40	0.05
Total	**25321.8**	**11.19**

8.2 Indian Export of Guargum to EU

Value in US $ Mill

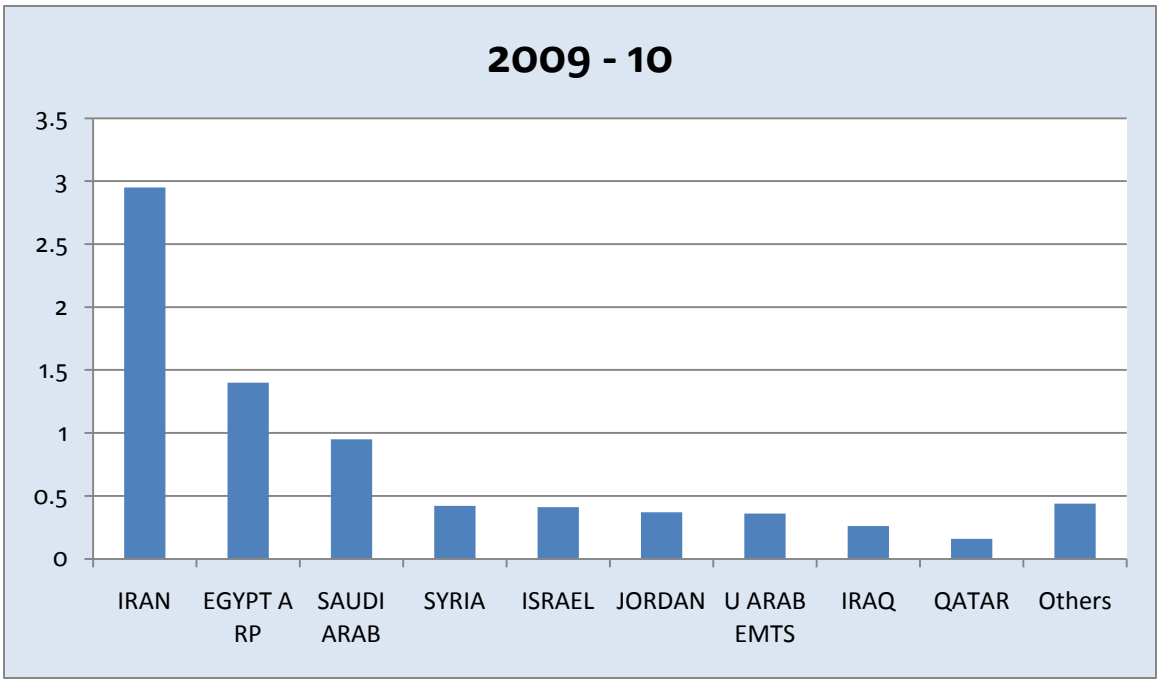


India Export Statistics

	2009-2010	
Country	Qty(MT)	Val in US $ Mill.
GERMANY	20598.92	21.97
ITALY	6754.81	5.87
NETHERLAND	3361.69	5.07
FRANCE	2872.91	4.69
U K	3402.55	3.71
BELGIUM	1691	2.73
DENMARK	1721.81	1.99
SPAIN	1242.53	1.37
POLAND	946.81	0.96
OTHERS	1002.2	0.87
Total	43595.23	49.23

8.3 India Export of Guargum to Middle East

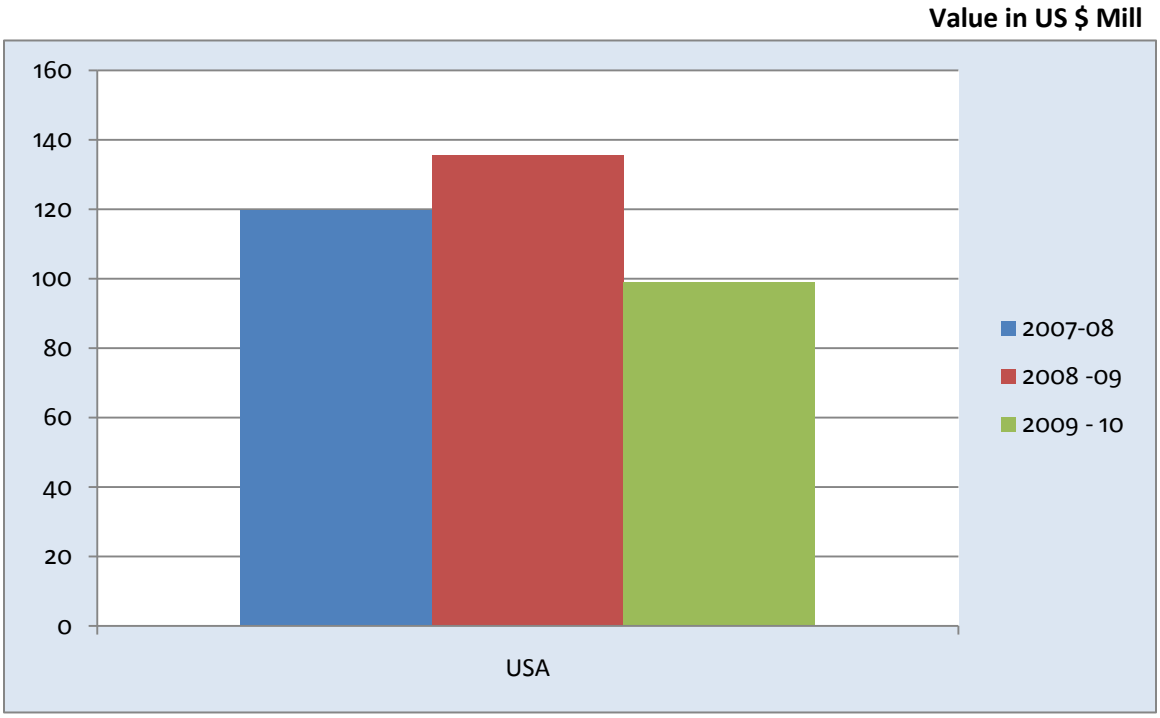
Value in US $ Mill



India Export Statistics

	2009-2010	
Country	Qty	Value
IRAN	4382.17	2.95
EGYPT A RP	921.32	1.4
SAUDI ARAB	587.09	0.95
SYRIA	384.99	0.42
ISRAEL	418.43	0.41
JORDAN	407.55	0.37
U ARAB EMTS	322.84	0.36
IRAQ	220	0.26
QATAR	147.53	0.16
OTHERS	543.22	0.44
Total	8335.14	7.72

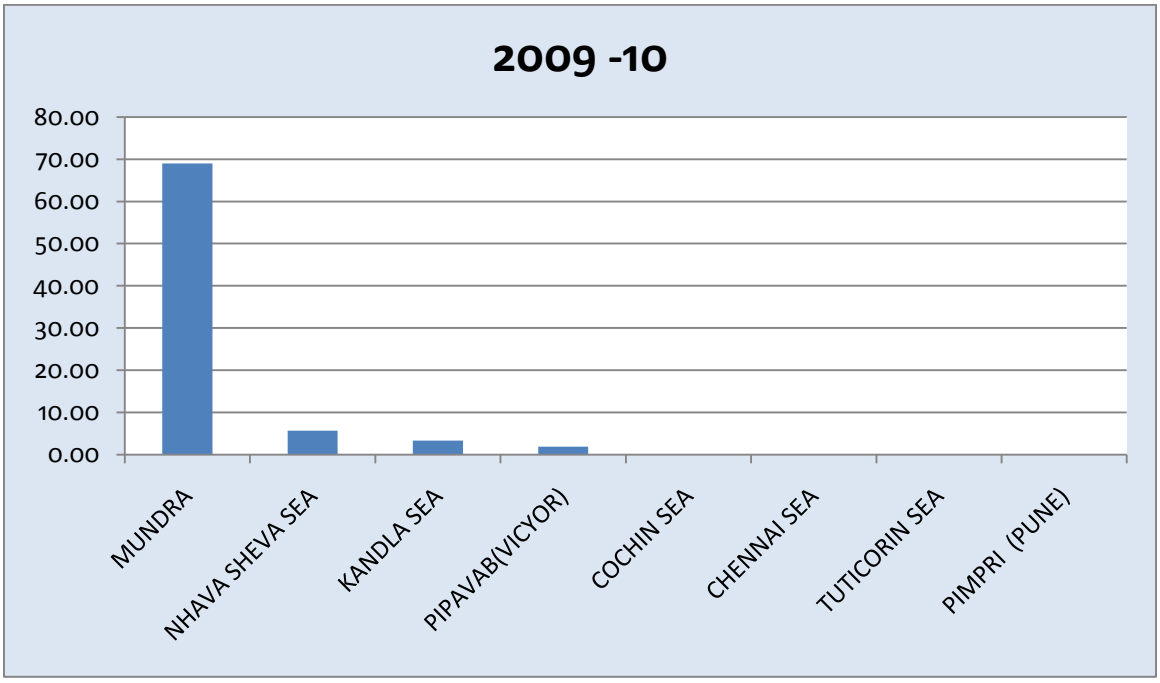
8.4 India Export of Guargum to USA



India Export Statistics

	2007-2008		2008-2009		2009-2010	
Country	Qty(MT)	Val US$ Mill	Qty(MT)	Val US$ Mill	Qty(MT)	Val US$ Mill
UNITED STATES	81774.56	119.66	97149.28	135.47	71922.86	98.83

8.5 Port Wise Export of Indian Guargum



India Export Statistics of Guargum – Port Wise

Port Name	Qty (MT)	Val USD Mill.
MUNDRA	88330.16	69.02
NHAVA SHEVA SEA	4018.32	5.66
KANDLA SEA	2236.00	3.33
PIPAVAB(VICYOR)	3709.65	1.91
COCHIN SEA	13.90	0.04
CHENNAI SEA	41.22	0.04
TUTICORIN SEA	0.82	0.00
PIMPRI (PUNE)	0.01	0.00
Total	**98350.08**	**79.99**

9. Quality Standards

Indian Agmarket Grade and Standard

Codex Standards

9.1 Indian Agmark Grade and Standard

GUAR GUM GRADING AND MARKING RULES

1. **Short title, application and commencement-**

(1) These rules may be called the Guar Gum Grading and Marking rules, 1982.

(2) They shall apply to the Guar Gum produced in India .

(3) They shall come into force on the date of their publication in the Official Gazette.

2. Definitions.- In these rules, unless the context otherwise requires;

(a) "Agricultural Marketing Adviser" means the Agricultural Marketing Adviser to the Government of India.

(b) "Authorised Packer" means a person or a body of persons who has been granted a certificate of authorisation under rule 3 of the General Grading and Markmg Rules, 1937, in relation to Guar Gum;

(c) "Schedule" means a Schedule appended to these rules.

3. **Grade designations:-** The grade designation to indicate the quality of Guar Gum shall be as set out in column 1 of Schedule I to III.

4. **Definition of quality**.- The quality indicated by the grade designation shall be as set out against each grade designation in columns 2 to 8 of Schedule I and II and columns 2 to 11 of Schedule III.

5. **Grade designation Mark.---** (i) The grade designation mark shall consist of label bearing a design consisting of an out line map of India with the word AGMARK and the figure of the rising sun with the words "Produce of India" and resembling the mark set out In Schedule IV.

NOTE:

(i) The grade designation mark to be used on paper or cloth bags shall consist of a paste on label specifying the grade designation.

(ii) The grade designation mark to be used on B-twill jute bags shall consist of a rectangular tie-on label specifying the grade designation.

6. Method of marking .- (1) The grade designation mark shall be securely affixed or Stenciled on each container in a manner approved by the Agricultural Marketing Adviser and shall also indicate the number of the certificate of authorisation issued to the packer by the Agricultural Marketing Adviser.

(2) In addition to the grade designation mark every container shall be clearly marked with the following particulars, namely:-

(a) Date of

packing; (b) Lot

number;

(c) Name and address of the

packer; (d) Net weight; and

(e) Any other particulars as may be specified by the
Agricultural Marketing
Adviser.

(3) The authorised packer may, after obtaining the prior approval of the Agricultural Marketing Adviser, mark his private trade mark on a container in a manner approved by the said officer, provided the private trade mark does not represent quality or grade of the Guar Gum different from that indicate by the grade designation mark affixed on the container in accordance with these rules.

7. Method of packing .- The Guar Gum shall be packed only in sound clean, dry and un-used containers made of B-twill just or in polythene bags placed in gunny bags or multi-ply craft paper sacks or any other material as may be approved by the Agricultural Marketing Adviser. The container shall be free from any insect infestation or fungus contamination and also free from any undesirable smell.

(2) The container shall be securely closed and sealed in The manner approved by the Agricultural Marketing Adviser.

(3) Each package shall contain Guar Gum of one trade description and one grade designation only.

SCHEDULE I

(*See* rules 3 and 4)

Grade designations and definitions of quality of undehusked split (crude) Guar Gum

	Definition of quality						
	Special characteristics						General Characteristics
	Moisture Per cent by weight (Maximum)	Ash per cent by weight (Maximum)	Protein per cent by weight (on dry basis)	Residue insoluble in acid, per cent by weight (maximum)	Gum (minimum) by weight	Black splits* per cent by weight (maximum)	
1	2	3	4	5	6	7	8
Standard	10.0	1.0	Not more than 9%	13.0	70.0	4.0	The undehusked split guar gum shall : (a) be obtained by milling guar from guar pods of the plant botanically known as Cyamopsis tetragonoloba family Leguminosae. (b) be free from dirt, dust added colouring matter visible mould growth insect infestation and ob- noxious smell. (c)have characteristics shape, size and colour.
General	12.0	2.0	Not more than 9% seeds	14.0	67.0	7.0	

*Includes organic extraneous matter such as stems/straw/chaff to the extent of 0.5 per cent for standard grade and 1.0 per cent for general grade.

SCHEDULE II

(*See* rules 3 and 4)

Grade designation and definitions of quality of dehusked split (Refined) Guar Gum

	Definition of quality						
	Special characteristics						General Characteristics
Grade Designation	Moisture Per cent by weight (Maximum)	Ash per cent by weight (Maximum)	Protein per cent by weight (on dry basis)	Residue insoluble in acid, by weight (maximum)	Gum per cent by weight (minimum)	Black splits* per cent by weight (maximum	
1	2	3	4	5	6	7	8
Standard	10.0	1.0	Not more than 9%	5.0	80.0	1.0	The dehusked split guar gum shall:

General	11.0	2.0	Not more than 9%	7.0	75.0	2.0	(a be obtained by milling guar seeds after removal of husk guar pod of the plant botanically known as Cyamopsis Leguminosae family. (b) be free from dirt, added colouring visible mould obnoxious smell. (c) have characteristic shape, size and co lour insect infestation and

* Includes organic extraneous matter such as stems, straw, chaff.

SCHEDULE III

(*See* rules 3 and 4)

Grade designation and definition of quality of Guar Gum (pulverized) powder

Grade designation	Definition of Quality								
	Special characteristics								
	Moisture Percent by weight (Max.)	Ash, Percent by weight (Max.)	Protein, Percent by weight (on dry basis)	Residue, insoluble in acid percent by weight (Max.)	Gum, Percent by weight (Mini.)	Viscosity at 25^{O} C in centipoises (Mini.)	PH	Arsenic (As_2O_3) ppm (max.)	Lead ppm (Max.)
1	2	3	4	5	6	7	8	9	10
Grade-1	11.0	0.5	Not more than 9%	3.0	80.0	3000	5.5-7.5	1.0	5
Grade-II	12.0	1.0	Not more than 9%	5.0	70.0	2000	6.0-8.0	1.0	5
Grade-III	13.0	1.5	Not more than 9%	7.0	55.0	1000	6.0-8.0	1.0	5

General Characteristics

11

The guar gum powder shall:-
(a) be the produce obtained after multistage grinding of the guar seeds from guar pods of the plant botanically known as *Cyamopsis tetragonolobu as L*eguminosae family
(b) be free from added starch, extraneous matter, added colouring matter, visible mould growth, insect infestation and obnoxious smell.
(c) pass through 300 micron sieve/as per specific sieve requirements of the buyers. Tolerance for sieve size 5%

Source : http://agmarknet.nic.in/guargumgmr.pdf

9.2 Codex Standard for Guar gum

Codex Alimentarius Commission – monograph (2008) - Guar gum (412)

GUAR GUM

Prepared at the 69th JECFA (2008), published in FAO JECFA Monographs 5 (2008), superseding tentative specifications prepared at the 67th JECFA (2006) and published in FAO JECFA Monographs 3 (2006). An ADI "not specified" was established at the 19th JECFA (1975).

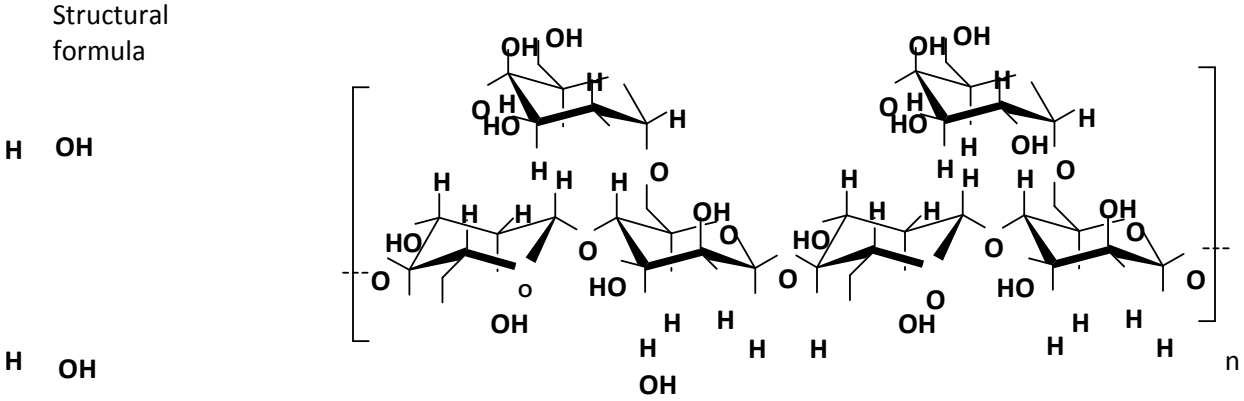
SYNONYMS Gum cyamopsis, guar flour; INS No. 412

9.2 (a) Definition

Primarily the ground endosperm of the seeds from *Cyamopsis tetragonolobus* (L.) Taub. (Fam. *Leguminosae*) mainly consisting of high molecular weight (50,000-8,000,000) polysaccharides composed of galactomannans; the mannose:galactose ratio is about 2:1. The seeds are crushed to eliminate the germ, the endosperm is dehusked, milled and screened to obtain the ground endosperm (native guar gum). The gum may be washed with ethanol or isopropanol to control the microbiological load (washed guar gum).

C.A.S. number 9000-30-0

Structural formula



DESCRIPTION White to yellowish-white, nearly odourless, free-flowing powder

FUNCTIONAL USES Thickener, stabilizer, emulsifier

9.2 (b) Characteristics

IDENTIFICATION

Solubility (Vol. 4) Insoluble in ethanol

Gel formation Add small amounts of sodium borate TS to an aqueous dispersion of the sample; a gel is formed.

Viscosity Transfer 2 g of the sample into a 400-ml beaker and moisten thoroughly with about 4 ml of isopropanol. Add 200 ml of water with vigorous stirring until the gum is completely and uniformly dispersed. An opalescent, viscous solution is formed. Transfer

100 ml of this solution into another 400-ml beaker, heat the mixture in a boiling water bath for about 10 min and cool to room temperature. There is no substantial increase in viscosity (differentiating guar gums from carob bean gums).

Gum constituents (Vol. 4) Proceed as directed under Gum Constituents Identification using 100 mg of the sample instead of 200 mg and 1 to 10 µl of the hydrolysate instead of 1 to 5 µl. Use galactose and mannose as reference standards. These constituents should be present.

Microscopic examination Place some ground sample in an aqueous solution containing 0.5% iodine and 1% potassium iodide on a glass slide and examine under a microscope. Guar gum shows close groups of round to pear formed cells, their contents being yellow to brown.

9.2 (c) Purity

Loss on drying (Vol. 4)	Not more than 15.0% (105°, 5 h)
Borate	Absent by the following test Disperse 1 g of the sample in 100 ml of water. The dispersion should remain fluid and not form a gel on standing. Mix 10 ml of dilute hydrochloric acid with the dispersion, and apply one drop of the resulting mixture to turmeric paper. No brownish red colour is formed.
Total ash (Vol. 4)	Not more than 1.5% (800°, 3-4 h)
Acid-insoluble matter (Vol. 4)	Not more than 7.0%

Protein (Vol. 4) — Not more than 10.0%
Proceed as directed under Nitrogen Determination (Kjeldahl Method) in Volume 4 (under "General Methods, Inorganic components"). The percentage of nitrogen determined multiplied by 6.25 gives the percentage of protein in the sample.

Residual solvents — Not more than 1% of ethanol or isopropanol, singly or in combination
See description under TESTS

Lead (Vol. 4) — Not more than 2 mg/kg
Determine using an AAS/ICP-AES technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the methods described in Volume 4 (under "General Methods, Metallic Impurities").

Microbiological criteria (Vol. 4)

Initially prepare a 10^{-1} dilution by adding a 50 g sample to 450 ml of Butterfield's phosphate-buffered dilution water and homogenizing the mixture in a high-speed blender.

Total (aerobic) plate count : Not more than 5,000 CFU/g
E. coli: Negative in 1g
Salmonella: Negative in 25g
Yeasts and moulds: Not more than 500 CFU/g

9.2 (d) Tests

PURITY TESTS

Residual solvents — Determine by gas chromatography in Volume 4 (under "Analytical Techniques, Chromatography").

Chromatography conditions
Column: 25% Diphenyl-75% dimethylpolysiloxane (60 m x 0.25 mm i.d., 0.25 µm film) [Aquatic-2 (GL-Sciences Inc.) or equivalent] Carrier gas: Helium
Flow rate: 1.5 ml/min
Detector: Flame-ionization detector (FID)
Temperatures:
- injector: 280°
- column: Hold for 6 min at 40°, then 40-110° at 4°/min, 110-250° at 25°/min, hold for 10 min at 250°

- detector: 250°

Standard solutions

Solvent standard solution: Transfer 100 mg each of chromatography grade ethanol and isopropanol into a 100-ml volumetric flask containing about 90 ml water and dilute to 100 ml with water.

TBA standard solution: Transfer 100 mg of chromatography grade tertiary-butyl alcohol (TBA) into a 100-ml volumetric flask containing about 90 ml water and dilute to 100 ml with water.

Mixed standard solutions: Transfer 1, 2, 3, 4 and 5 ml of Solvent standard solution into each of five 100-ml volumetric flasks. Add 4 ml of TBA standard solution to each flask and dilute to volume with water.

Sample preparation

Disperse 1 ml of a suitable antifoam emulsion, such as Dow- Corning G-10 or equivalent, in 200 ml of water contained in a 1000-ml 24/40 round-bottom distilling flask. Add about 4 g of the sample, accurately weighed, and shake for 1 h on a wrist-action mechanical shaker. Connect the flask to a fractionating column, and distil about 95 ml, adjusting the heat so that foam does not enter the column. Add 4 ml of TBA standard solution to the distillate and make up to 100 ml with water to obtain the Sample solution.

Standard curves

Inject 1 µl of each Mixed standard solution into the chromatograph. Measure the peak areas for each solvent and TBA. Construct the standard curves by plotting the ratios of the peak areas of each of the solvents/TBA against the concentrations of each solvent (mg/ml) in the Mixed standard solutions.

Procedure

Inject 1 µl of the Sample solution into the chromatograph. Measure the peak areas for each solvent and TBA. Calculate the ratios of the peak areas of each solvent/TBA, and obtain the concentration of each solvent from the standard curves.

Calculate the percentage of each solvent from:

$$\% \text{ Solvent} = (C \times 100/W \times 1000) \times 100$$

where C is the concentration of solvent (mg/ml)

W is weight of sample (g)

Source : http://www.fao.org/ag/agn/jecfaadditives/specs/monograph5/additive-218-m5.pdf

10.Documentation for Export

For export of Agricultural produce documents related to -

1. Goods
2. Shipment
3. Payment
4. Quality of goods
5. Foreign exchange regulation.

10.1 Documents related to goods:-

a) Invoice- Sellers bill for trade & contains particulars about goods (prepared by exporter)
b) Packing List - Consolidated statement of contents of number of packs (prepared by exporter)
c) Certificate of origin- Specifies the country of [reduction of goods(obtained by Chamber of Commerce)

10.2 Documents related to shipment :-

a) Mate Receipt:- Mate receipt is a receipt issued by the commanding office of the ship when the cargo is loaded.

b) Shipping Bill :- Shipping bill is a main document on the basis of which the customers permission for export is given.[Prepared by Exporter/CHA & certified by custom Authority]

c) Bill of handing:- Bill of handing is a document wherein the shipping company gives its official receipts of the goods shipped in its vessel and contracts to carry them to part of destination.

d) Airway Bill:- (Air Consignment Note) is a receipt issued by an airline for the carriage of goods.

10.2 Documents related to Payment:-

a) Letter of Credit (L/C):- Issued by an importers bank in favor of exporter giving him the authority to draw bills to assure the payment against delivery of goods.

b) Bill of Exchange:- Bill of exchange is an instrument. Containing an unconditional order directing a certain person to pay a certain sum of money to the bearer of the instrument.

10.3 Documents related to quality of goods:-

a) Phytosanitory Certificate :- Issued by plant protection authorities certifies that material is free from quarantine pests & other injurious pests. It is specific to country of importer.

b) HACCP Certification:- (Hazard Analysis Critical Control Point)

- European Quality Standard.
- Hygienic Codes of Practices.
- Certification for Agro Sector, food, drinks and allied industry.

Certifying Agency:-

- American Quality Assessors (I) Pvt. Ltd., Hydrabad
- Quality Services & Solutions (QSS) Pvt. Ltd. Mumbai

c)Euro gap Certification:-

[European Retail Parties Good Agricultural Practices]
- European Quality Standards
- It incorporates Integrated pest management and Integrated crop management

d)Health Certificate:-

-Certificate issued by food Laboratory showing that that food is fit for human consumption.

Certifying Agency:-

1) State Health Laboratory,Yerwada,Pune
2) Municipal Laboratory,Dadar, Mumbai

e)Organic Certification:-

- Certificate indicating material produce is based on organic farming.

Certifying Agency:-

1) Ecocert International, Aurangabad
2) Skal International,Bangalore
3) SGS India Pvt.Ltd,Gurgaon

10.4 Documents related to Foreign Exchange Regulations:-

GR Form: Documents required by RBI which assures to RBI that the exporter will release the proceeds of goods within 180 days from the date of Shipment.

10.5 Other Document :

Bank Realization Certification(BRC):- This is the advice given by Foreign Exchange Bank after the realization of money from importer against the goods delivered to him.

11. Government Schemes

a) Schemes for Market Development

b) Schemes for Infrastructure Development

c) Schemes for Quality Development

d) Schemes for Research and Development

e) Transport Assistance 2007-12

11.1 Schemes for Market Development

Components	**Pattern of Assistance**
A. Packaging Development	
Component 1	
* Activity for development of packaging standards and design *Up-gradation of already developed packing standards	100% for APEDAinternal scheme
Component 2	
Assistance to exporters for use of packaging material as per standards and specifications developed or adopted by APEDA	Assistance to registered exporters of fresh fruits & vegetables, flowers and eggs @ 25% of the total cost of packaging material subject to a ceiling of Rs 5 lakh

B. Feasibility Studies, Surveys, Consultancy and Database Up-gradation	
Component 1	
Development and dissemination of market information with base on products, infrastructure etc.	100% to be implemented by APEDA
Component 2	
Assistance for conducting feasibility studies etc.	50% of the total cost subject to a ceiling of Rs 5.00 lakh per beneficiary in accordance with MDA/MAI guidelines
Component 3	
Assistance for conducting surveys, feasibility studies etc. for the common benefit of a number of exporters who may be the members of the Associations/Boards/Apex Bodies etc/belonging to a group being assisted/serviced by Govt./Semi-Government Organisation	Assistance will be in line with the guidelines of MDA Scheme
C. Export Promotion and Market Development	
Component 1	
Supply of material, samples, product literature, development of website,advertisement etc.for publicity and market promotion for fairs/events organized /sponsored by APEDA	100% to be implemented by APEDA
Component 2	
Publicity and promotion through preparation of product literature, publicity material, advertisement, film etc. by APEDA	100% to be implemented by APEDA
Component 3	
Brand publicity (Product specific Indian Brands) through advertisement etc. Brand promotion for those brands which are of Indian origin , advertisement in international print/electronic media, website development etc.	25% of the total cost subject to a ceiling of Rs 50.00 lakh in a year on reimbursement basis subject to auditing of the accounts. Not to be extended to an exporter beyond 3 consecutive years. Norms for

	providing assistance would be framed by APEDA
Component 4	
Export promotion by APEDA for undertaking activities like buyer-seller meet, product promotion, exchange of delegations, participation in exhibitions/fairs/events etc.	100% of the cost for APEDA For exporters, assistance would be provided in the pattern of MDA guidelines
Component 5	
Generic publicity of Indian agricultural and processed products	100% of the cost for APEDA For exporters, assistance would be provided on the pattern of MDA guidelines.

11.2 Schemes for Infrastructure Development

Components	**Pattern of Assistance**
PART I	
Establishment of common infrastructure facilities by APEDA or any other Government or Public Sector agency like Airport Authority of India or Port Trust etc.	100% grant-in-aid
PART II	
A) Assistance for purchase of specialised transport units for animal products horticulture and floriculture sector	25% of the cost subject to a ceiling of Rs.2.50 lakh per beneficiary.
B) Assistance to exporters//producers/growers/Cooperative organization and federations for horticulture and floriculture sector for	

i) Mechanisation of harvest operation of the produce.	25% of the cost subject to a ceiling of Rs.5.00 lakh per beneficiary
ii) Setting up of sheds for intermediate storage and grading / storage / cleaning operation of produce.	25% of the cost of equipment subject to a ceiling of Rs.5.00 lakh per beneficiary
iii) a) Setting up of mechanized handling facilities including sorting, grading, washing, waxing, ripening, packaging & palletisation etc.	25% of the cost of equipment subject to a ceiling of Rs.10.00 lakh per beneficiary
b) Setting up of both pre cooling facilities with proper handling system as well as cold storage for storing	25% of the cost of equipment subject to a ceiling of Rs.10.00 lakh per beneficiary
c) Providing facilities for preshipment treatment such as fumigation, X-ray screening, hot water dip treatment, Water softening Plant	25% of the cost of equipment subject to a ceiling of Rs.10.00 lakh per beneficiary
d) Setting up of integrated post harvest-handling system (pack houses / green houses with any two or more of the above facilities)	25% of the cost subject to a ceiling of Rs.25.00 lakh per beneficiary
e) Setting up of vapor heat (treatment, electronic beam processing or irradiation facilities	50% of the cost subject to a ceiling of Rs.25 lakh per beneficiary
f) Assistance for setting up of environment control system e.g. pollution control, effluent treatment etc	25% of the cost subject to a ceiling of Rs.25 lakh per beneficiary
g) Setting up of specilised storage facilites such as high humidity cold storage deep freezers, controlled atmosphere (CA) or modified atmosphere (MA) storage etc.	25% of the cost subject to a ceiling of Rs.10 lakh per beneficiary

11.3 Schemes for Quality Development

Components	**Pattern of Assistance**
A.Promotion of Quality and Quality Control	
Component 1	
Assistance etc. for setting up/strengthening laboratories	25% of the cost subject to a ceiling of Rs 20 lakh per beneficiary. Quality standards should be adhered to for availing the subsidy
Component 2	
Assistance of installing quality management, quality assurance and quality control systems such as ISO series, HACCP, TQM, KOSHER,BRC,GAP, Organic Certification and ERP based traceability etc. including consultancy, quality improvement and certification etc.	50% of the cost subject to a ceiling of Rs 5 lakh per beneficiary
Component 3	
Activities related to standardization and quality control such as preparation of quality assurance manuals, guidelines, documents, standards, upgradation and recognition of labs for export testing, certifying exporters as premium quality exporters etc. pesticide management program, national and international standardization activities	100% for APEDA
Component 4	
Upgradation and recognition of labs for export testing	1. 50% of the cost for private labs; 2. 100% for the Central Government labs; and 3. 75% for State Govt /University labs The above is subject to a ceiling of Rs 50 lakh
Component 5	

Testing of water, soil, residues of pesticide, veterinary drugs, hormones, toxins, heavy metal contaminants in agricultural produce/products "including all fruits and vegetables, processed fruits and vegetables, other processed foods, floriculture, animal products, cereals etc.	50% of the total cost subject to a ceiling of Rs 5000/- per sample (pre-negotiated price with APEDA) in case where residue monitoring activity is proposed by APEDA
B. Capacity Building and Organisation Management	
Component 1	
Assistance for upgradation of technical and managerial skills through on spot training in India/abroad	100% of cost of the programme organized by APEDA subject to a ceiling of Rs 1.5 lakh per representative (not more than three from single organization)
Component 2	
Assistance for organizing seminars/group activities including study tour within the country and for bringing out information literature	50% of the total cost subject to a ceiling of Rs 1 lakh for national seminar and Rs 2 lakh for international seminar
Component 3	
Seminars organized by APEDA	100%
Component 4	
Assistance programme for international study tour sponsored or organized by APEDA and association of exporters	100% in case of APEDA sponsored activities only

11.4 Schemes for Research and Development

Components	**Pattern of Assistance**
Component 1	
Assistance for technology development through R & D efforts with research institution under Government/Public Sector	100% in case of APEDA
Component 2	
Assistance to recognized exporters associations of APEDA to support relevant research and development for export enhancement through R & D organizations in co-operative/private sector	Upto 50% of the total cost of the project subject to a ceiling of Rs 20 lakh

11.5 Transport Assistance for Export of Horticulture, Processed food products and Poultry products

Govt. of India vide its Order No. 1/2/2007-EP(Agri IV) dated May 15 , 2008, has approved the Scheme for the grant of Transport Assistance for Export of identified Horticulture, Processed Food & Poultry Products as contained in Point No. 26 and 28. The benefit will be available for export made with effect from 01/04/2007 to 31/3/2012. The procedure and terms and conditions for claiming transport assistance will be as under and valid for exports shipment during 1st April 2007 up to 31st March 2012.

1) Exporters should claim transport assistance on shipment basis. One single application should be made for shipments made during one fortnight i.e. 1st to 15th and 16th to end of the calendar month. However, in exceptional cases two applications may be made for one fortnight.

2) It is mandatory for an applicant to enter the application in the APEDA web site giving all the information about the shipment as per the prescribed format placed on the web site
The User ID and Password for entering the application shall be the same as already provided by APEDA for online applications.

3) An Application Tracking Number (ATN) will be generated and an acknowledgement summary of shipment and claim for transport assistance would be produced by the Web Site on completion of successful entry of application. The Exporter should print these documents and attach as the covering sheet of the application along with documents as detailed
in clause 8 & 30 and submit to the appropriate office. In the summary sheet of shipment and claim for transport assistance, the page numbers are to be filled in by the exporter according to the physical documents attached.

4) All claims for shipment made within a fortnight should be bunched together and submitted as a single application and attach the summary of shipment along with declaration and acknowledgement generated online along with them.

5) The HS Codes for eligible items are provided at the APEDA website. However, if
the product that has been exported does not appear in the list of eligible products and exporter feels that the same is eligible, clarification may be sought from APEDA. The online system would not allow the application to be filed.

Note: In case of mismatch between APEDA codes and the codes used by the importing countries, APEDA may consider on case to case basis, subject to its sole discretion for determining the relevant code, provided the same product description exists in all documents submitted to APEDA by the exporter.

6) The applications received shall be considered on first come first served basis, based on the date of physical receipt of the document and subject to availability of funds.

7) The date of physical receipt of documents along with the application in the APEDA office will be the date of claim for consideration. The date of actual shipment as per airway bill/bill of lading would be deemed to be the date of shipment. (Flight / Vessel Date is actual Flight Date on Air Way Bill in case of Air & Shipped on Board Date on Bill of Lading in case of Sea.)

Non-submission of all the documents as per clause 8 & 29 (FOB shipments) shall result in non-acceptance of claim application by APEDA and shall be rejected.

8) Applications should be accompanied with the following documents duly stamped
and signed by the respective authorities:

- **a)** Custom Certified export promotion copy of the Shipping Bill (EP Copy) in original. To facilitate the exporters to avail of other export benefits APEDA shall accept self-certified copy of the shipping bill along with indemnity bond .
- **b)** Custom certified Short Shipment Certificate in original, if any. (However self certified copy can be accepted in case Xerox copy of SB along with Indemnity bond)
- **c)** Bank / Custom certified copy of the commercial Invoice in original.
- **d)** Self certified photocopy of the original Airway Bill / Bill of Lading.
- **e)** Self certified photocopy of the original Freight Forwarder Bill/Receipt.
- **f)** Certificate of Realization of Foreign Exchange by Bank (BRC) in original in Form No. 1 of **Appendix 22** of Handbook of Procedures of Ministry of Commerce & Industry . Applicant to obtain Bank Realization Certificate (BRC) evidencing value in equivalent Indian Rupees from the Bank as well as equivalent value in US$. In case the realization is not in US Dollar then a CA certificate certifying the equivalent value in US dollar may be provided.

9) Alterations in the documents, if any, should be authenticated by Airlines / Shipping Lines / Customs Authorities / Other Authorities as the case may be. Any correction not authenticated by the issuing authority shall be considered as discrepancy.

10) In case of eligible and non eligible items if exported in the same shipping bill, the onus of proof of eligible items shall lie with the exporters. The exporters will provide a Chartered Accountants certificate in the required proforma .

11) In case of sea shipments, the basic freight and in case of air shipments total freight would be considered for calculation of Transport Assistance.

12) The items exported along with their respective quantities should be individually mentioned on the invoice and the shipping bills along with HS Code.

13) The Shipping Bill / Bill of Lading / Airway Bill as well as the Invoice must clearly indicate the description of items, number of their packages / cartons along with the net and gross weight of each item separately.

14) Flight details / Vessel details, with date must be mentioned on the export promotion copy of the shipping bills as well as the Airway bills / Bill of Lading copies.

15) The freight invoice must clearly indicate various components like basic freight BAF, CAF etc. otherwise it would be returned with discrepancy note.

Other Applicable Conditions

16) Transport assistance shall be paid only to the exporter effecting shipments and not to any other party i.e. the exporter whose name appears on the documents as the exporting party.

Application Dates and Related Procedures

17) Applications will be received by APEDA by following PRESCRIBED DATES:

For all shipments effected from **1st July 2008** onwards, shall be submitted on or **before the end of 180 days from the last date of concerned fortnight**. No request whatsoever for extension would be accepted.

Penalties on Late Submission and Rejection

18) In case of delay in submission of applications beyond the above prescribed dates, the following penalties shall be imposed:

Period of Delay	**Penalty cut in % of Assistance admissible**

a) Applications received after prescribed date but within 30 days from the prescribed date	5 %
b) Applications received from 31 days to 60 days of the prescribed date.	10 %
c) Applications received from 61 days to 90 days of the prescribed date.	20 %
d) Applications received after 90 days of the prescribed date shall not be accepted.	Total Rejection

19) In case of export oriented units (EOUs) submission TAS claims has been allowed upto 365 days as per the Foreign Trade Policy (Para 6.12, chapter – 6) instead of 180 days. In such cases there would be no relaxation for late submission with penalty as applicable in normal cases. The conditions of first and second re-submissions would be same as provided in the guidelines.

20) In case of any discrepancy advice has been sent, the re-submission of application **shall** be done at the same office of APEDA where the application was filed:

a) A maximum of two re-submissions are permissible.
b) First re-submission - 60 days from the date of issue of discrepancy advice.
c) Second re-submission - 30 days from the date of issue of second discrepancy advice.
d) If discrepancies are not rectified within the stipulated time as per b) & c) above then the cases shall be closed automatically by the online software.

For every resubmission due to discrepancies found, an additional penalty of 1% on the amount of Assistance pertaining to that submission, shall be levied over and above the penalty for delayed submission.

Miscellaneous

21) The processing charges as decided by the Govt. would be applicable. Currently the charges are 5% of the total amount paid to exporter by APEDA as Transport Assistance.

22) In case of any disputes the matters relating to interpretation of any of these clauses will be referred to Ministry of Commerce, Govt. of India, whose decision shall be final and binding.

23) In the event of any false claims being lodged, intending/attempting/succeeding in drawing subsidy without entitlement, APEDA shall refer the case to he Govt. for necessary penal action.

24) The transport assistance shall be released only after verification of the documents as contained in this letter and after verification of details and relevant documents/as may be required by APEDA. Exporters are advised to refer to the checklist on the website before submitting the documents.

25) APEDA reserves the right to cross check the facts submitted by exporter, directly with customs, airlines, shipping lines, freight forwarders and any other institution / office as it deems fit.

Applicability for Transport Assistance

26) The norms for TA calculation are as follows:

TA Norms for Exports by Air	
For Fresh Cut Flowers/ Bouquets- fresh	**Other Eligible Items (except Fresh Cut Flowers)**
Least of:	Least of:
» 20% of FOB value	» 10% of FOB value
» 25% of freight	» 25% of freight
» Specific rate (Rs.per kg)	» Specific rate (Rs. per kg)

TA Norms for Exports by Sea	
For eligible products exported in non-reefer containers	**For eligible products exported in reefer containers**
Least of:	Least of:
» 10% of FOB value	» 10% of FOB value

TA Norms for Exports by Sea	
For eligible products exported in non-reefer containers	**For eligible products exported in reefer containers**
» 25% of freight	» 33% of freight (inclusive of Inland freight in reefer containers) (see note below)
» Specific rate (Rs. per kg)	» Specific rate (Rs. per kg) »
	50% of ocean freight

Transport Assistance shall be payable on the basis of net weight fo sea shipments and gross weight in case of air shipments.

27) Eligible Items and Permissible Destinations for Air / Sea Transport Assistance are listed below:

Air

Eligible Products/ Item	Destinations	Minimum FOB (Rs./kg)
Floriculture		
Fresh Cut Flowers/ Bouquets - see Note (1) below	All Destinations except neighbouring countries	70
Live Plants and Bulbs		70
Tissue Culture Plants		1400
Fresh Fruits		
Litchis	All Destinations except neighbouring countries	12
Pineapples		15
Other Fresh Fruits (excluding Mangoes and Grapes) with an FOB value of Rs.25/kg and above		25
Mangoes and Grapes	Non-traditional destinations only - see Note (2) below	25
Fresh Vegetables		
Fresh Vegetables (including organically grown vegetables and mixed vegetables but excluding Nendran Bananas and Fresh Mushrooms) with a min FOB ealization of Rs. 25/kg and above	All Destinations except neighbouring countries	25
Fresh Mushrooms		30
Banana (Nendran variety) - see Note (3) below	Middle East only	15
Poultry Products		
Hatching Eggs (including SPF eggs)	Middle East and Africa	80
Fresh Culinary Herbs - see Note (4) below	All Destinations except neighbouring countries	50
Animal Products		
Sheep Casings	All Destinations except neighbouring countries	1000

Note: (1) Fresh cut flowers/ Bouquet of fresh flowers include all types of flowers including roses, gerbera, chrysanthemum, eryngium, hypericium, fragrant indigenous flowers (champa, chameli, mogra etc.), summer flowers, gossipium, lizianthus, carnations, marigold, tubercose, heliconias, anthuriums, lilies, cut foilages, potted plants, decorative floral items/ bouquets etc.

(2) Non-traditional destinations for Mangoes and Grapes are limited to the following: Americas (North and South), Russia and CIS countries, Japan and Australia and New Zealand

(3) Only for Nendran Variety of Bananas from Kerala that are exported from airports in Kerala or Tamil Nadu

(4) Only for culinary herbs exported in fresh form and under APEDA's list of Scheduled products.

By SEA

Eligible Products/ Item	Destinations	Minimum FOB (Rs./ kg.)
Fresh/ Chilled Fruits		
Litchis	All Destinations except neighbouring countries. For Mangoes and Grapes non-traditional markets only - see Note (1) below	12
Pineapples		15
Banana		15
All Other Fresh/ Chilled Fruits(including mangoes and grapes) with a FOB value of Rs. 25/ Kg and above		25
Fresh/ Chilled Vegetables (including organically grown vegetables and mixed vegetables) with a FOB value of Rs. 25/ Kg and above	All Destinations except neighbouring countries	25
Processed Vegetables		
(1) All Dried and Preserved Vegetables (Acetic Acid/ Vinegar/ Brine) (including Onions in Acetic Acid and Potato Flakes/ Powder but excluding Pulses)	All Destinations except neighbouring countries	30
(2) Gherkins and Cucumbers (Prepared / preserved)		15

Eligible Products/ Item	Destinations	Minimum FOB (Rs./ kg.)
(3) Dehydrated Onion & Garlic (Flakes/Powder)	All Destinations except neighbouring countries and Europe	50
(4) Pickles/ Chutneys (Of Fruits or of Vegetables or mixture of Fruits and Vegetables)	All Destinations except neighbouring countries	50
(5) Mushrooms Prepared/ Preserved	All Destinations except neighbouring countries	50
(6)Ready to Eat/ Cook Curries/ Meals and Snack Foods in Consumer Packs	All Destinations except neighbouring countries	50
(7) All processed Vegetables in Frozen/ IQF form	All Destinations except neighbouring countries	50
Processed Fruits		
(1) All Processed Fruit Preparations (Excluding squashes, juices and pulps)	All Destinations except neighbouring countries	40
(2) Fruit Squash		60
(3) Fruit Juices		45
(4) Fruit Pulps in Frozen/ Aseptic Form		50
Poultry Products		
Table Eggs	All Destinations except neighbouring countries	40
Eggs not in Shell (Dried/Cooked)/ Whole Egg Powder		170
Egg Yolk Dried/ Egg Yolk Powder		170
Frozen Poultry Meat and Processed Poultry Products		45
Animal Products		

Frozen (Boneless) Buffalo meat	West African Countries only	70
Dairy products		
Milk powder (Whole & Skimmed)	All Destinations except neighbouring countries	100
Cheese (in all forms) including in reefer containers		150
UHT milk		20
Ice-creams (including frozen desserts)		70
Floriculture		
Fresh Cut Flowers - see Note (2) below	All Destinations except neighbouring countries	70
Dried Flowers		40
Medicinal Plants - see Note (3) below	All Destinations except neighbouring countries	40

Note: (1) Non-traditional destinations for Mangoes and Grapes are limited to the following: Americas (North and South), Russia and CIS countries, Japan and Australia and New Zealand.

(2) Fresh cut flowers/ Bouquet of fresh flowers include all types of flowers including roses, gerbera, chrysanthemum, eryngium, hypericium, fragrant indigenous flowers (champa, chameli, mogra etc.), summer flowers, gossipium, lizianthus, carnations, marigold, tubercose, heliconias, anthuriums, lilies, cut foilages, potted plants, decorative items/ exotic flowers, etc..

(3) Only for Medicinal Plants falling under APEDA's list of Scheduled products.

28) In the Shipping bill, the quantity endorsed by Customs in the reverse of the shipping bill, if present, will be accepted as the quantity of the shipping bill.

29) If the Export has been done on FOB Basis with the Transport cost paid on Delivery by the Importer, then the Cost Paid for Transport shall be considered for Transport Assistance Calculations, ONLY on submission of the following documents:
a. Custom Certified export promotion copy of the Shipping bill (EP copy) in original**.** (To facilitate the exporters to avail of other export benefits APEDA shall accept self-certified copy of the shipping bill along with indemnity bond .
b. Custom certified Short Shipment Certificate in original, if any

c. Bank/custom certified copy of the commercial invoice in original
d. Self-certified copy of the original airway bill /bill of lading
e. Certificate of realization of foreign exchange by bank (BRC) in original in form no. 1 of Appendix 22 of Handbook of Procedures of Foreign Trade Policy (Specimen at Annexure III). Applicant to obtain BRC evidencing value in equivalent Indian Rupees from the bank as well as in USD. In case the realization is not in USD then a CA certificate certifying the
equivalent value in USD may be provided.
f. Copy of invoice /bill raised on the importer by the shipping company /agent based in the importing country mentioning the no. of airway bill /bill of lading /container for the freight paid on the said export consignment duly attested/certified by the importer with seal.
g. Certificate from Importer in the prescribed form as to the amount of freight paid by Importer against the invoice of the shipping company .
h. Indemnity bond (on Rs. 100/- stamp paper duly notarized) from exporter undertaking to indemnify APEDA against any loss suffered on account of claim filed on basis of false information.
i. CA certificate certifying the items exported along with HS code and correlating it with shipping bill / bill of lading /invoice.

Applicability for Sea Transport Assistance

30) Eligible Items and Permissible Destinations for Sea Transport Assistance are
listed in Point No. 26.

31) The Freight charges for surface transportation within India, (as well as within
the destination country) for the items eligible for transport assistance under this scheme will not be eligible for transport assistance except in case of Transportation by reefer container. Transport Assistance would be provided only on ***Port-to-Port Destination basis***.

Miscellaneous
32) APEDA will have right to recover from export or beneficiary any payment made in excess of the eligible claim of the exporter or beneficiary.

Specific TA Rates for Exports of Eligible Items by Air

Destination	Specific TA Rate (Rs. Per kg)	
	For all eligible products/items except Fresh Cut Flowers	Fresh Cut Flowers
Europe	17	25
Africa	15	25
Middle East	7	8
CIS Countries	7	9
South East Asia	7	9
Far East & North Asia (incl. China & Japan)	18	25
North America (USA, Canada & Mexico)	25	35
Central America & Caribbean	25	35
South America	25	35
Australia & New Zealand	18	27

Specific TA Rates for Exports of Eligible Items by Sea

Destination	TA Rate (Rs. per kg)	
	Reefer Container	Non-reefer Container
Europe	6.0	1.5
Africa	6.0	1.5
Middle East	3.0	1.0
CIS Countries	6.0	1.25
South East Asia	3.0	1.0
Far East & North Asia (incl. China & Japan)	6.0	1.25
North America (USA, Canada & Mexico)	8.0	2.5
Central America & Caribbean	8.0	2.5
South America	8.0	2.5
Australia & New Zealand	6.0	1.25

11.6 State schemes of Rajasthan and Gujarat

Rajas than

Establishment of Agri Export Zone for Guar in Rajasthan (Jodhpur and Ganga Nagar Region)

A Guar gum processing unit is being considered by APEDA (Agricultural and Processed Food Products Export Development Authority) for being set up around Jodhpur, which will provide value addition to this monopoly item presently being exported from the State in raw form. The State Government is required to prepare a detailed Project Report and submit the same to the Department of Commerce.

Gujarat

Incentives

In India most projects in the agro industrial sector have been too highly leveraged considering the seasonal availability of raw material and their perishability, which contribute to considerable variability in revenues and concomitant debt repayment capability of the business. This has resulted in a reluctance of the financial sector to lend to this sector.

The Government of Gujarat will offer an attractive package of financial support and incentives for agro industrial projects to reputed companies with proven technical capability and track record to successfully conceive and implement agro industrial projects. Projects under the ambit of infrastructure, marketing, research and development and facilitation will be eligible for these incentives.

Incentive would be available to new Units as well as existing Units undertaking technology upgradation, modernisation, expansion or diversification. Incentives would be available in entire State except areas covered under jurisdiction of Municipal Corporation of Ahmedabad, Vadodara, Surat, Rajkot, Jamnagar and Bhavnagar. However, Cold Chain projects and Retail outlets for perishables will be entitled for incentives in areas under jurisdiction of Municipal Corporations also.

INTEREST SUBSIDY TO AGRO INDUSTRIAL UNITS

The State Government will offer back ended interest subsidy to Tiny, Small, Medium and Large agro industrial units, as under:

1. 6% per annum back ended interest subsidy for first 5 years, from commencement of operations,
2. The aggregate interest subsidy will not exceed Rs.100 lacs,
3. The interest subsidy will be available on the funds borrowed from financial institutions/banks for capital investments only. No interest subsidy will be available towards working capital loan or any other loan, which is not in the nature of Term Loan meant for acquiring capital assets,
4. The interest subsidy will be released so long as the eligible unit continues timely repayment of the loan and remains in production.

AGRI INFRASTRUCTURE DEVELOPMENT:

The experience world over has demonstrated that impeccable agri supply chain infrastructure is key to a vibrant and competitive agriculture and agro industrial sector. The piecemeal attempts so far of setting up infrastructure for agri produce in Gujarat will be replaced by an well-orchestrated effort from the Government for coordinated and integrated infrastructure development all across the State.

In order to spearhead the development of infrastructure facilities in an efficient manner, the Government needs to plan the facilities that are required and pro-actively promote and support the same. Government has therefore decided to accord the highest priority for creation of supply chain infrastructure and support services for the agro industrial sector to create world class infrastructure corridors integrated with appropriate surface transport connections, cold storages, auction centres and retail chains.

The State Government will offer the following incentives for projects providing common infrastructure facilities in the value chain of agri produce from farm to market as decided by Single Window Clearance Committee:

1. Back ended interest subsidy as follows :
    a. 6% per annum back ended interest subsidy for first 5 years, from commencement of operations.
    b. The aggregate interest subsidy will not exceed Rs.400 lacs.
    c. The interest subsidy will be available on the funds borrowed from financial institutions/banks for capital investments only. No interest subsidy will be available towards working capital loan or any other loan, which is not of the nature of Term Loan • meant for acquiring capital assets.
    d. The interest subsidy will be released so long as the eligibleunit continues timely repayment of the loan.
2. The State Government will assist in preparing pre-feasibility studies through Gujarat Infrastructure Development Board.,
3. The State Government intends to provide Government land including agriculture farms on long lease basis at reasonable rates.

12. EU Commission Regulation for Indian Guargum

Information as regards the application of Commission Regulation (EU) No 258/2010 of 25 March 2010 imposing special conditions on the import of guar gum originating in or consigned from India, due to contamination risks by pentachlorophenol and dioxins, and repealing Decision 2008/352/EC

Guar gum originating in India,

- imported into the EU from Switzerland, or

- exported from EU to Switzerland

The Federal Office for Public Health from Switzerland adopted on 12 May 2010 the Ordinance 817.026.1 as regards guar gum originating in or consigned from India.

The Ordinance contains the same provisions for import in Switzerland of guar gum originating in or consigned from India as the provisions provided for in Regulation (EU) 258/2010 for import in the EU of guar gum originating in or consigned from India.

Article 2 (2) of Regulation (EU) 258/2010 provides that the certificate accompanied by an analytical report shall be signed by an authorised representative of the Ministry of Commerce and Industry of India and the validity of the certificate shall not exceed 4 months from the date of its issue.

A problem has been identified with guar gum originating from India that was imported into Switzerland before the expiry date of the certificate. That consignment of guar gum, eventually after repacking /reprocessing in Switzerland, was exported to the EU from Switzerland after the expiry of the validity of the certificate and was refused for import into the EU because of the expiry of the validity of the health certificate. This situation with export from an EU country to Switzerland can also occur.

To address this issue,it has been agreed with the competent authorities from Switzerland that a consignment of guar gum originating in India can be exported to the EU after the expiry of the validity of the health certificate, on the condition that - it is evident from the documents that the consignment guar gum was imported in Switzerland before the expiry of validity date of the health certificate, or - the consignment guar gum is accompanied by an official attestation from the competent authorities of Switzerland that the consignment of guar gum originating in India has been imported in Switzerland before the expiry of the validity of the health certificate.The same provisions/procedure apply for guar gum originating in India exported from the EU to Switzerland after the expiry of the validity of the certificate

13. Guargum Import Requirements of Major Importing Countries

13.1 Import requirements for USA

All consignments of guar gum or products containing guar gum will require:

- A Health Certificate issued by the Indian authorities
- An Analytical Report completed by an accredited laboratory
- Both documents are to be signed by an authorised representative of the Ministry of Commerce and Industry of India. HMRC will not release the products to free circulation unless the official controls have been carried out and that the result of such controls is favourable.
- Indian Guar gum may be brought into the United States without advance permission, provided they are declared, inspected, and found free of pests.

Documents Requred

i. commercial invoice:
ii. certificate of origin:
iii. packing lists:
iv. bill of lading:
v. sanitary/phytosanitary certificates
vi. Health certificate

Tariff - 0 %

13.2 Import requirements for China PR

Companies seeking to engage in import trade only need to register with the Ministry of Commerce (MOFCOM) or its authorized local offices according to the Foreign Trade Law and the Measures on Filing and Registration of Foreign Trade Operators

- Health certificate, analytical report ,
- China has a range of labeling and packaging requirement The Guar Gum shall be packed only in sound clean, dry and un-used containers made of B-twill just or in polythene bags

Documents Required

- Commercial Invoice: A Commercial Invoice is required for all non-document shipments. A specific format is not required, although the following basic information must be included:
- The shipper's and consignee's name and address and telephone number
- The place and date of shipment
- A detailed description of the goods
- Harmonized code of shipment
- The FOB value of each item
- The country of origin
- The quantity and weight
- Currency used
- Freight and Insurance Charges as applicable

Tariff - Seeds: 0 % , Others – 3 %

13.3 Import requirements for Germany

EU regulations for Guar gum Imports. Consignments of India guar gum – or compounds containing at least 10 per cent of the substance - must have an appropriately authorized health certificate certifying they do not contain more than 0.01 mg/kg pentachlorophenol (PCP).

Documents Required

i. commercial invoice:
ii. certificate of origin:
iii. packing lists:
iv. bill of lading:
v. sanitary/phytosanitary certificates
vi. Health certificate

Tariff - 0 %

13.4 Import requirements for Russia

LABELING REQUIREMENTS

- All products are required to have labeling and relevant information in the **Russian** language. Russian law requires that the following information be placed on the label
- Product name; Producer's name, country, and address; Importer's name and address; Product volume; Food additives and flavorings; Mark of Conformity

Documents Required

- Commercial Invoice
- Bill of Ladding

- Insurance
- certificate of origin
- Health certificate
- Packing list

Tariff - 5 %

13.5 Import requirements for Italy

EU regulations for Guar gum Imports. Consignments of India guar gum – or compounds containing at least 10 per cent of the substance - must have an appropriately authorized health certificate certifying they do not contain more than 0.01 mg/kg pentachlorophenol (PCP).

i. commercial invoice:
ii. certificate of origin:
iii. packing lists:
iv. bill of lading:
v. sanitary/phytosanitary certificates
vi. Health certificate

Tariff - 0 %

13.6 Import requirements for Netherland

EU regulations for Guar gum Imports. Consignments of India guar gum – or compounds containing at least 10 per cent of the substance - must have an appropriately authorized health certificate certifying they do not contain more than 0.01 mg/kg pentachlorophenol (PCP).

i. commercial invoice:

ii. certificate of origin:
iii. packing lists:
iv. bill of lading:
v. sanitary/phytosanitary certificates
vi. Health certificate

Tariff - 0 %

13.7 Import requirements for France

EU regulations for Guar gum Imports. Consignments of India guar gum – or compounds containing at least 10 per cent of the substance - must have an appropriately authorized health certificate certifying they do not contain more than 0.01 mg/kg pentachlorophenol (PCP).

i. commercial invoice:
ii. certificate of origin:
iii. packing lists:
iv. bill of lading:
v. sanitary/phytosanitary certificates
vi. Health certificate

Tariff - 0 %

13.8 Import requirements for Australia

- Buyer needs Pro-Forma Invoice to their Bank for Letter of Credit can be drawn up and sent to Sellers bank.
- Commercial Invoice

- Packing Declaration
- Packing List
- Certificate of Origin
- Fumigation Certificate
- Marine Insurance
- Bill of lading
- Health and Food safety requirements compliance

Tariff - 0 %

13.9 Import requirements for Turkey

Turkey's Ministerial Decree on the Regime of Technical Regulations and Standardization for Foreign Trade provides a unified standardization policy that establishes a legal base for the harmonization of Turkish legislation with that of the European Union (EU) and the international trade community.

- commercial invoice:
- certificate of origin:
- packing lists:
- bill of lading:
- sanitary/phytosanitary certificates
- Health certificate

Tariff - 2 %

13.10 Import requirements for Brazil

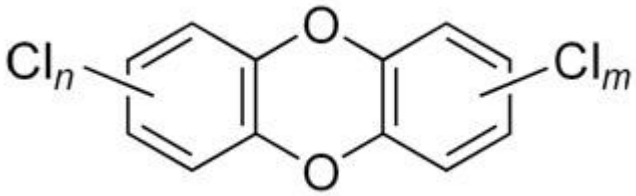
- Bills of Lading – No special regulations
- Certificates of Origin – A Certificate of Origin is recommended to be provided for every commodity subject to import licensing and /or quota restrictions from some origin countries.
- Commercial Invoices – Invoices are required for all dutiable shipments relating to commercial transactions should show freight, insurance and similar charges as separate items when applicable, regardless of the INCOTERM used on the transaction.
- Health certificates , sanitary/phytosanitary certificates
- Pacing list

14. EU and Indian Guar gum approach for dioxins

Guar gum is a food additive commonly used as an emulsifier and stabilizer in processed food. It is generally a minor ingredient in food stuffs but is found in a wide variety of food products. In 2007, the European Commission discovered serious contamination of guar gum with dioxins and pentachlorophenol originating from India. Guar Gum contained measurable residues of dioxins., it has been suggested by the European Commission (EC) that a toxic equivalent (TEQ) of 0.75 ng TEQ/kg product be adopted in order to det ermine if guar gum samples contain higher than background levels of dioxin contamination. *Food and Drug Regulations* (FDR) lists the maximum use rate of guar gum as an ingredient in processed foods as 1.0%, levels of dioxin and dioxin-like chemicals in guar gum samples would not pose an unacceptable health risk provided the guar gum is used in accordance with provisions found within the FDR.

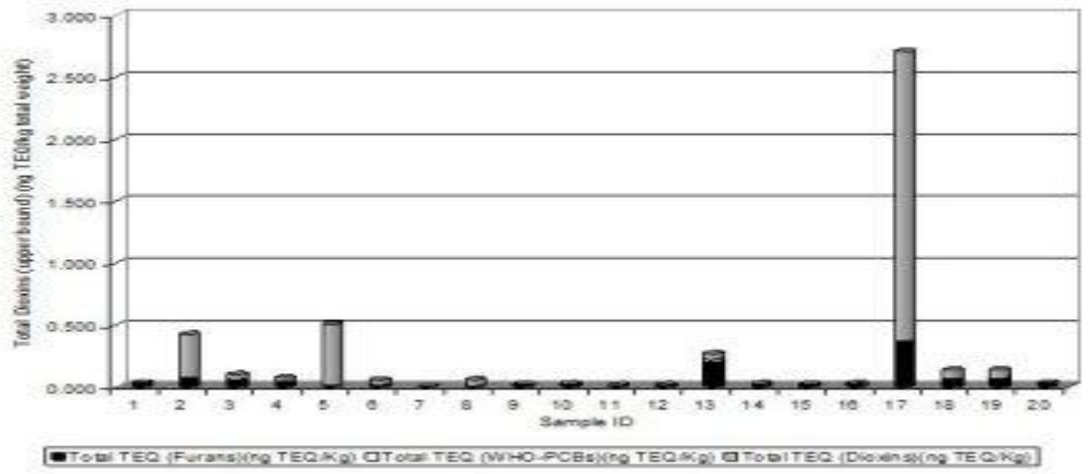
Dioxins

The name ‘dioxins' is often used for the family of structurally and chemically related polychlorinated dibenzo para dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). Certain dioxin-like polychlorinated biphenyls (PCBs) with similar toxic properties are also included under the term ‘dioxins'. Some 419 types of dioxin-related compounds have been identified but only about 30 of these are considered to have significant toxicity, with 2,3,7,8-tetrachlorodibenzo para dioxin (TCDD) being the most toxic.



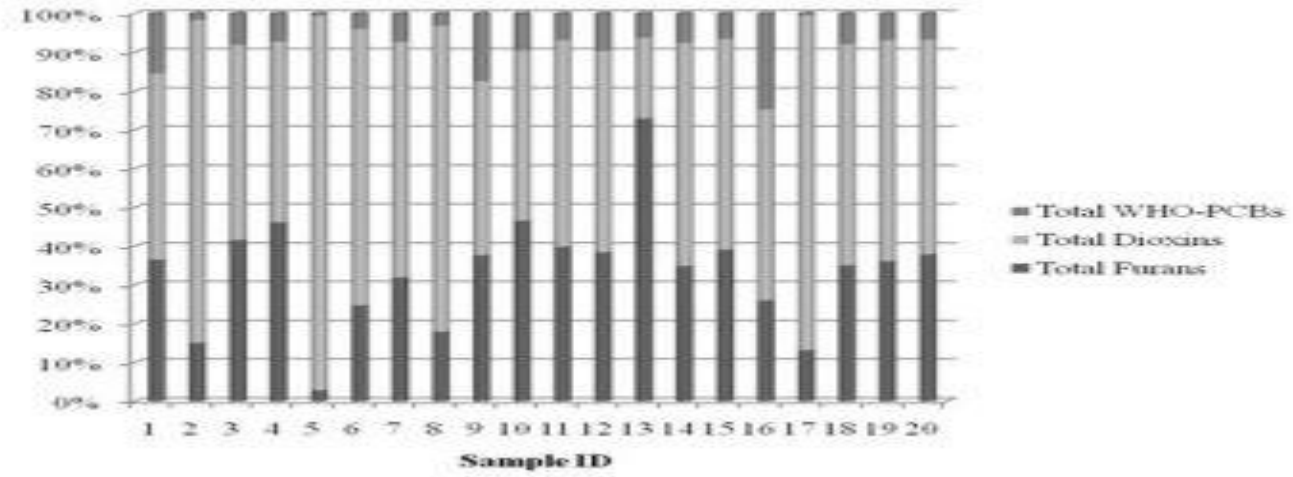
Total dioxins in 20 guar gum samples from India ranged from 0.034 – 2.731ng TEQ/kg total weight (upper bound) with a mean of 0.258 ng TEQ/kg total weight (SD = 0.598). Of the 20 samples, one sample (2.731 ng TEQ/kg total weight) exceeded the European Union's dioxin limit of 0.75 ng PCDD/F WHO-TEQ/kg product, which is considered to be unacceptably contaminated with dioxins

Dioxin total toxic equivalence (TEQ) in guar gum samples imported from India (ng TEQ/kg total weight).							
		N	**Mean**	**Median**	**Minimum**	**Maximum**	**Standard Deviation**
Chlorinated dibenzofurans	Lower bound	20	0.051	0.019	0.003	0.361	0.085
Chlorinated dibenzofurans	Upper bound	20	0.053	0.020	0.011	0.361	0.084
Chlorinated dibenzo-p-dioxins	Lower bound	20	0.181	0.023	0.001	2.336	0.523
Chlorinated dibenzo-p-dioxins	Upper bound	20	0.196	0.036	0.019	2.344	0.521
Polychlorinated biphenyls (PCBs)	Lower bound	20	0.006	0.005	0.000	0.017	0.005
Polychlorinated biphenyls (PCBs)	Upper bound	20	0.007	0.005	0.002	0.017	0.004
Total Dioxins (Σ dioxins, furans and PCBs)	**Lower bound**	**20**	**0.238**	**0.048**	**0.006**	**2.709**	**0.598**
Total Dioxins (Σ dioxins, furans and PCBs)	**Upper bound**	**20**	**0.258**	**0.070**	**0.034**	**2.731**	**0.598**



Upper bound total dioxin levels (ng TEQ/kg total weight) in guar gum sampled from India. Total dioxin levels include residues from chlorinated dibenzo-p-dioxins, chlorinated dibenzofurans, non- and mono-ortho substituted PCBs.

European Union's suggested maximum allowable level of contamination (0.75 ng PCDD/F WHO TEQ/kg product).



Proportions of WHO-PCBs, Dioxins & Furans in Guar Gum

Guar gum is used as a minor food ingredient (generally comprising <1.0% of total ingredients), and the EU suggested maximum dioxin levels in guar gum are much lower than the EU established maximum TEQs for other foodstuffs Therefore, it would be reasonable to conclude that guar gum contaminated with dioxins at the levels seen would not contribute significantly to the total dietary dioxin exposure of individuals who consumed products containing the maximum allowable concentrations of guar gum. Exposures to dioxins are much more likely to be from more conventional sources such as meats and other fatty animal commodities. contaminated guar gum is not destined for human/animal consumption.

15. Market Analysis of Major markets for Guargum

15.1 List of Importing markets of Mucilages & thickeners derived from locust beans & seeds or guar seeds

Unit : US Dollar thousand

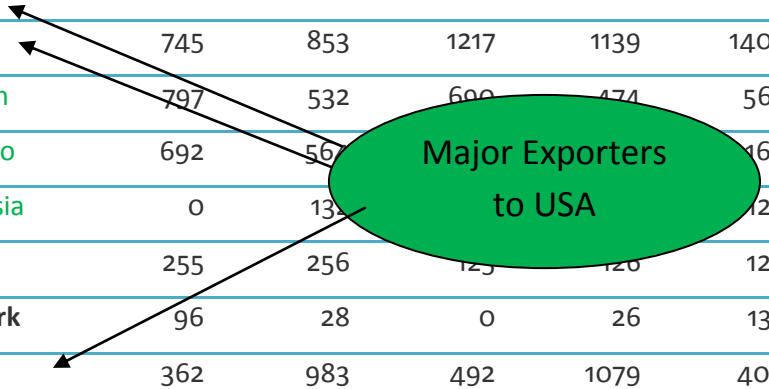
Importers	Imported value in 2010-M03	Imported value in 2010-M04	Imported value in 2010-M05	Imported value in 2010-M06	Imported value in 2010-M07	Imported value in 2010-M08	Imported value in 2010-M09	Imported value in 2010-M10	Imported value in 2010-M11	Imported value in 2010-M12	Imported value in 2011-M01	Imported value in 2011-M02
United States of America	17881	22591	23198	24984	22538	30178	20388	29047	29412	25921	33811	30748
Brazil	1104	646	688	644	551	670	1021	1074	1266	470	852	1014
Australia	880	1573	889	961	1072	1210	699	765	627	691	1201	956
Switzerland	570	293	674	498	885	482	640	459	246	313	442	515
Thailand	711	669	859	1058	546	1097	513	976	721	531	479	390
Turkey	349	616	353	516	327	511	497	415	170	363	278	265
Ireland	128	149	36	158	177	81	171	148	133	173		
Italy	1653	1873	1547	2067	1792	1505	2351	3128	2350	1154		
Japan	3402	4463	2608	1998	3629	2016	2202	1912	2105	2513	2403	
Republic of Korea	702	1038	563	665	581	633	624	1165	616	373		
Mexico	951	1105	1504	1362	1045	1429	917	1033	1105	713	1414	
Chinese Taipei	244	104	275	320	378	600	286	147	265	395		
Morocco	44	3	1	90	2	8	31	32				
Netherlands	1616	849	968	979	794	625	1364	1046	1094	1060		
Norway	106	249	187	168	153	118	136	249	253	120		
Pakistan	171	128	118	306	254	175						
Philippines	50	215	194	243	157	189	154	39	237			

Poland	1202	570	373	573	615	911	784	635	484	625	
Singapore	298	280	105	235	401	198	427	192	280	202	
South Africa	472	570	1225	713	1353	325	1053	974	985	558	
Spain	815	899	633	812	714	581	597	1038	675	318	
Sweden	135	130	203	322	200	117	201	255	183	157	
Germany	5157	5736	4897	6326	4945	7360	6290	6865	5494	5878	
Greece	93	104	63	33	18	63	9	40	28	57	
Hungary	172	64	94	92	160	123	89	86	91	89	
Egypt	91	20	88	72	116	44	70	123	55	76	
United Kingdom	1276	1759	1116	1230	1459	1537	1745	1075	1420	1271	1098
Austria	420	433	409	472	529	479	408	464	636	280	
Belgium	1187	1015	608	816	1145	924	915	1259	1002	695	
Uruguay	17	0	8	17	0	0	0	4	21	38	
Venezuela	30	13	207	44							
Argentina	741	473	257	495							
Bulgaria	61	15	30	27	47	75	26	20	60	5	
Canada	2512	1971	2030	1941	2811	2798	3072	3221	2686	2056	
Chile	233	143	225	224	307	144	463	172	346	298	
China	3118	2923	2440	2667	2458	3015	2721	1413	2264	2315	
Colombia	104	88	72	60	17	63	25	28	102	37	58
Cyprus	25	0	3	0	0	2	0	0	3	0	
Czech Republic	102	211	116	90	203	156	326	170	112	306	130
Denmark	3709	2469	2373	2330	1909	2383	1976	2280	2014	1630	
Estonia	610	23	534	5	6	0	17	15	7	7	
Finland	131	176	199	152	505	186	201	186	158	190	
France	2328	2799	2702	2996	2712	3073	2123	2247	2309	1658	2054

15.2 USA Importing Mucilages & thickeners derived from locust beans & seeds or guar seeds from Major Countries

Unit : US Dollar thousand

Exporters	Imported value in 2010-M03	Imported value in 2010-M04	Imported value in 2010-M05	Imported value in 2010-M06	Imported value in 2010-M07	Imported value in 2010-M08	Imported value in 2010-M09	Imported value in 2010-M10	Imported value in 2010-M11	Imported value in 2010-M12	Imported value in 2011-M01	Imported value in 2011-M02
World	17881	22591	23198	24984	22538	30178	20388	29047	29412	25921	33811	30748
India	14640	18901	20067	21324	19048	26788	17622	**25184**	**25785**	**23027**	**30749**	**28149**
Spain	745	853	1217	1139	1403	1386	815	**1888**	**1098**	**787**	**1342**	**1039**
Pakistan	797	532	690	474	563	401	727	492	**1062**	**422**	**820**	**838**
Morocco	692	56		169	549	140	562	414	275	223	186	
Indonesia	0	13		28	0	95	0	99	0	0	150	
China	255	256	125	126	126	126	0	0	0	250	0	125
Denmark	96	28	0	26	132	0	0	0	28	0	0	78
Italy	362	983	492	1079	400	674	616	**721**	**715**	**975**	**470**	53
United Kingdom	69	54	18	146	347	0	89	25	62	0	0	46
Netherlands	111	77	41	0	29	0	31	0	36	64	33	20
France	106	196	154	8	160	189	177	156	111	100	94	0

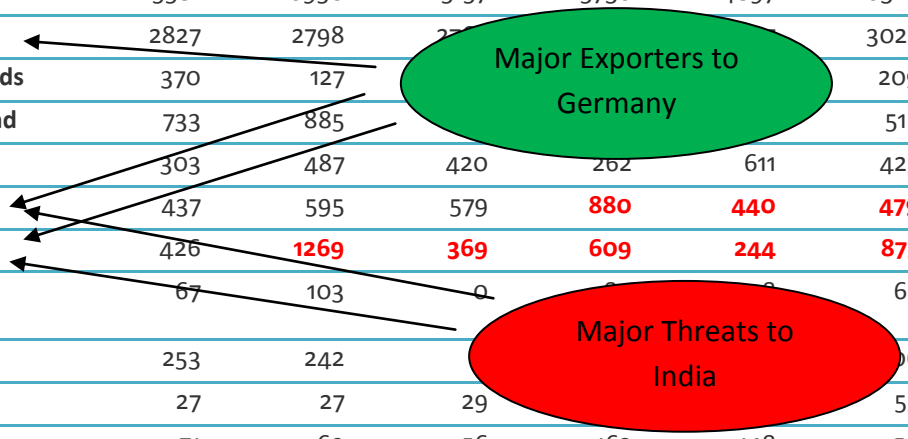


India contribute nearly 85 – 87 % of USA import of Guar . As from the above statistics it is clearly mentioned that India is the biggest exporters of Mucilages & thickeners derived from locust beans & seeds or guar seeds , followed by Pakistan , Spain & Italy as well. On later half of the year means from October to February India exports its maximum Guar to USA .

15.3 Germany Importing Mucilages & thickeners derived from locust beans & seeds or guar seeds from Major Countries

Unit : US Dollar thousand

Exporters	Imported value in 2010-M01	Imported value in 2010-M02	Imported value in 2010-M03	Imported value in 2010-M04	Imported value in 2010-M05	Imported value in 2010-M06	Imported value in 2010-M07	Imported value in 2010-M08	Imported value in 2010-M09	Imported value in 2010-M10	Imported value in 2010-M11	Imported value in 2010-M12
World	5581	6950	5157	5736	4897	6326	4945	7360	6290	6865	5494	5878
India	2827	2798				3025	2891	**3690**	**3171**	**3523**	**3121**	**3327**
Netherlands	370	127				209	231	183	140	266	41	728
Switzerland	733	885				512	397	478	540	580	547	385
France	303	487	420	262	611	423	813	695	428	617	516	313
Spain	437	595	579	**880**	**440**	**479**	**159**	**1015**	176	678	261	294
Italy	426	**1269**	**369**	**609**	**244**	**875**	262	**549**	**1441**	**635**	267	272
United Kingdom	67	103	0			65	40	208	106	28	208	229
Morocco	253	242				06	0	223	0	210	0	176
Pakistan	27	27	29			53	0	82	32	94	30	55
Belgium	71	69	56	163	148	56	101	90	29	85	55	49

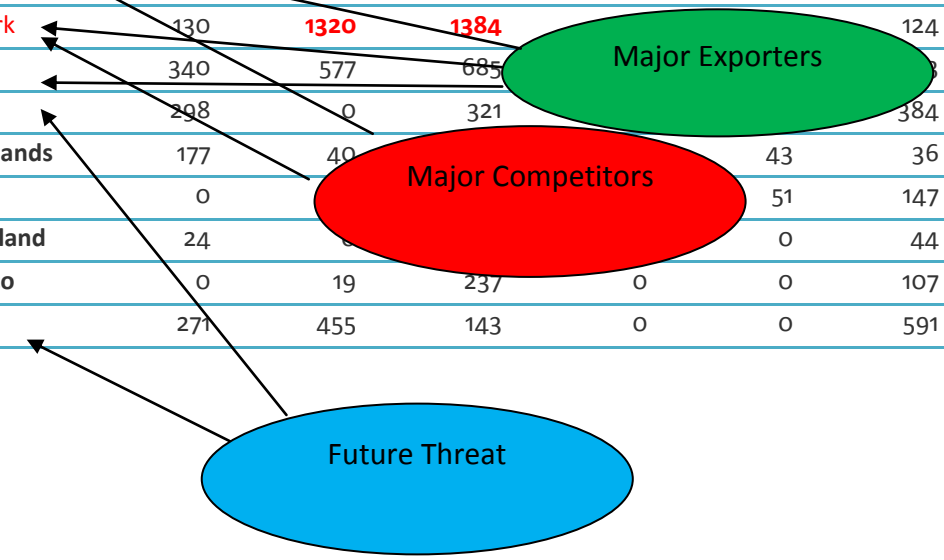


Although India is the biggest exporter of Mucilages & thickeners derived from locust beans & seeds or guar seeds to Germany yet from the above statistics we can see that Italy and Spain are the major threats for India. Italy and Spain are exporting its maximum product from March to September. Germany nearly import 50 – 55 % of its Guar from India.

15.4 Japan Importing Mucilages & thickeners derived from locust beans & seeds or guar seeds from Major Countries

Unit : US Dollar thousand

Exporters	Imported value in 2010-M02	Imported value in 2010-M03	Imported value in 2010-M04	Imported value in 2010-M05	Imported value in 2010-M06	Imported value in 2010-M07	Imported value in 2010-M08	Imported value in 2010-M09	Imported value in 2010-M10	Imported value in 2010-M11	Imported value in 2010-M12	Imported value in 2011-M01
World	2351	3402	4463	2608	1998	3629	2016	2202	1912	2105	2513	2403
Spain	780	395	**1074**	**1013**	**874**	**1047**	360	441	201	425	821	975
Pakistan	314	360	486	223	285	328	332	321	310	348	251	420
Denmark	130	**1320**	**1384**			124	296	0	0	304	429	399
India	340	577	685				438	637	669	478	386	323
USA	298	0	321			384	97	143	179	151	260	98
Netherlands	177	40			43	36	113	85	113	68	0	90
France	0				51	147	23	56	157	14	210	43
Switzerland	24				0	44	12	12	19	20	17	19
Morocco	0	19	237	0	0	107	32	9	0	0	0	18
Italy	271	455	143	0	0	591	9	451	244	248	9	0



Spain is the major exporter of Guar products to Japan. It is interesting here to know that Spain, Denmark export their guar in the month of March, April, May, June, July . India supply in a constant speed to Japan.

15.5 Russia Federation Importing Mucilages & thickeners derived from locust beans & seeds or guar seeds from Major Countries

Unit : US Dollar thousand

Exporters	Imported value in 2010-M01	Imported value in 2010-M02	Imported value in 2010-M03	Imported value in 2010-M04	Imported value in 2010-M05	Imported value in 2010-M06	Imported value in 2010-M07	Imported value in 2010-M08	Imported value in 2010-M09	Imported value in 2010-M10	Imported value in 2010-M11	Imported value in 2010-M12
USA	18			44	44	93			177	132	88	143
Switzerland	51	81		143	150	75				50		52
Belgium	46	65	56	36	43	45			66	74	52	24
Denmark	32			44	52	78			83	49	55	45
Germany	403				54	914	341	527	216	**812**	**194**	**980**
Italy					137	109	222		**137**	**247**	**103**	**579**
Lithuania	110	115	108	142	216		77					
Netherlands	38	16	85	110	41	37	36	65	12	66	19	50
Pakistan	24		54		24	24	28					
India	**1426**	**987**	**325**	**852**	**1311**	**2384**	**2518**	**1316**	**1818**			
Spain	166	18	2	9	163	23	25	21		49		4

Future Threat

Loop Holes of India

Major Exporters

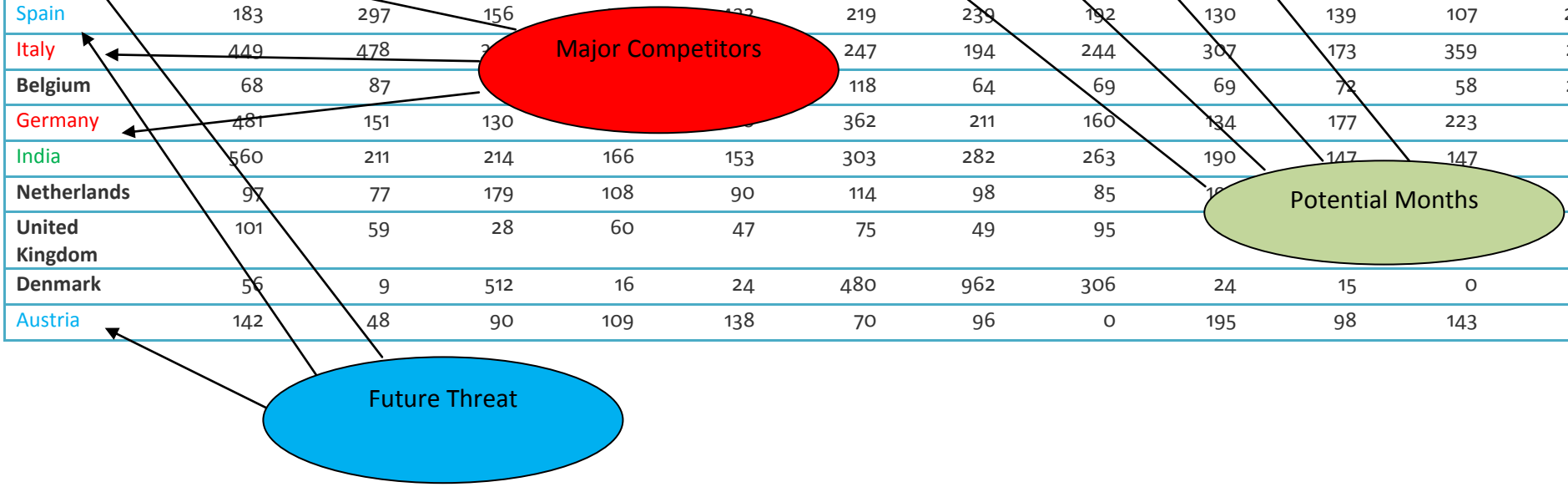
Major Competitors

Although for the Russian Federation India is top exporting country for guar products but from the statistics mentioned above it is clearly indicating that India has got certain loop holes specially on later half of the year . Indian is exporting nil in the month of October, November and December. On these months Germany and Italy are taking clear advantage over India and exporting their maximum product on these months. There are some future threats also like USA and Denmark who seems to be having keen interest in exporting their products continuously to Russian market.

15.6 France Importing Mucilages & thickeners derived from locust beans & seeds or guar seeds from Major Countries

Unit : US Dollar thousand

Exporters	Imported value in 2010-M02	Imported value in 2010-M03	Imported value in 2010-M04	Imported value in 2010-M05	Imported value in 2010-M06	Imported value in 2010-M07	Imported value in 2010-M08	Imported value in 2010-M09	Imported value in 2010-M10	Imported value in 2010-M11	Imported value in 2010-M12	Imported value in 2011-M01
World	2621	2328	2799	2702	2996	2712	3073	2123	2247	2309	1658	2054
Morocco	254	292	779	378	849	**179**	**620**	**225**	**447**	888	419	511
USA	216	447	318	543	438	518	226	480	379	296	0	293
Spain	183	297	156			219	239	192	130	139	107	248
Italy	449	478				247	194	244	307	173	359	232
Belgium	68	87				118	64	69	69	72	58	222
Germany	481	151	130			362	211	160	134	177	223	158
India	560	211	214	166	153	303	282	263	190	147	147	141
Netherlands	97	77	179	108	90	114	98	85				124
United Kingdom	101	59	28	60	47	75	49	95				54
Denmark	56	9	512	16	24	480	962	306	24	15	0	44
Austria	142	48	90	109	138	70	96	0	195	98	143	23

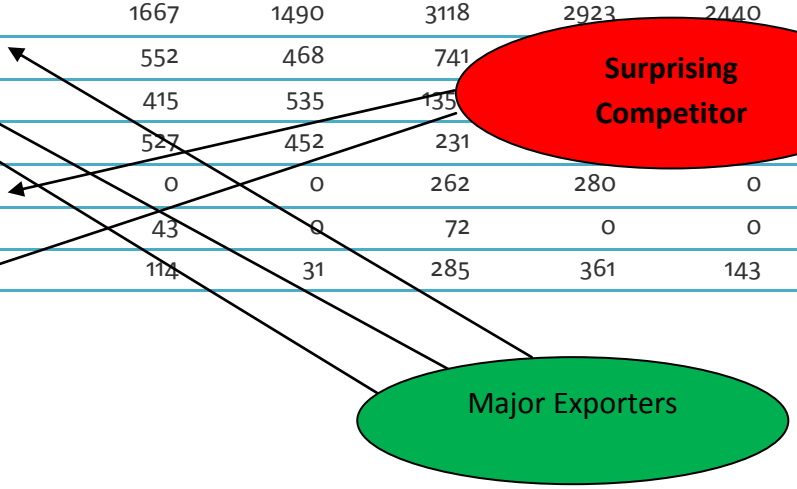


Morocco is the largest exporter of guar to France contributing nearly 25 – 35 % of total France import . Italy and Germany are other two major competitor for India. There are some future threat also like USA, Austria etc who are constantly supplying to France market. India contributes only 5-10 % of total import of France . We can analyze that Morocco doesn't export too much from July to October. These are the potential months for Indian exporters as it is the best time to penetrate in French market.

15.7 China Importing Mucilages & thickeners derived from locust beans & seeds or guar seeds from Major Countries

Unit : US Dollar thousand

Exporters	Imported value in 2010-M01	Imported value in 2010-M02	Imported value in 2010-M03	Imported value in 2010-M04	Imported value in 2010-M05	Imported value in 2010-M06	Imported value in 2010-M07	Imported value in 2010-M08	Imported value in 2010-M09	Imported value in 2010-M10	Imported value in 2010-M11	Imported value in 2010-M12
World	1667	1490	3118	2923	2440	2667	2458	3015	2721	1413	2264	2315
Pakistan	552	468	741			455	816	863	486	420	725	748
India	415	535	135			34	836	470	794	318	684	537
USA	527	452	231			715	518	916	410	470	594	410
Denmark	0	0	262	280	0	172	0	193	276	39	25	250
Morocco	43	0	72	0	0	72	36	258	0	6	93	214
Spain	114	31	285	361	143	349	151	113	327	18	72	0

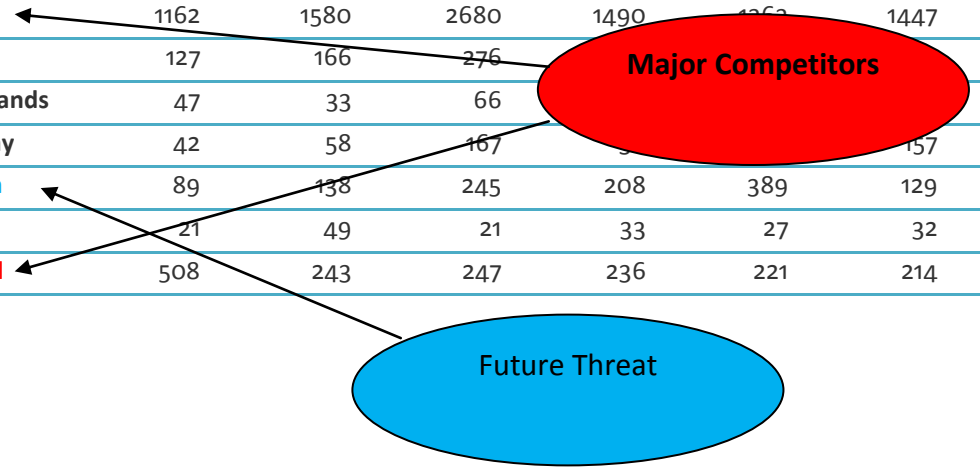


China is another one of the major importer of Guar products. India, Pakistan and USA are the top major exporting countries. There are some surprising competitor from Europe like Denmark and Spain who are exporting quite a good amount to China.

15.8 Denmark Importing Mucilages & thickeners derived from locust beans & seeds or guar seeds from Major Countries

Unit : US Dollar thousand

Exporters	Imported value in 2010-M01	Imported value in 2010-M02	Imported value in 2010-M03	Imported value in 2010-M04	Imported value in 2010-M05	Imported value in 2010-M06	Imported value in 2010-M07	Imported value in 2010-M08	Imported value in 2010-M09	Imported value in 2010-M10	Imported value in 2010-M11	Imported value in 2010-M12
World	2004	2285	3709	2469	2373	2330	1909	2383	1976	2280	2014	1630
Spain	1162	1580	2680	1490	[illegible]	1447	1554	1425	1588	1568	1565	1368
India	127	166	276	[illegible]	[illegible]	[illegible]	139	244	168	189	188	82
Netherlands	47	33	66	[illegible]	[illegible]	[illegible]	97	42	45	58	44	74
Germany	42	58	167	[illegible]	[illegible]	157	46	45	89	82	64	58
Pakistan	89	138	245	208	389	129	36	172	29	61	118	29
France	21	49	21	33	27	32	24	25	24	22	21	18
Portugal	508	243	247	236	221	214	0	422	0	272	0	0

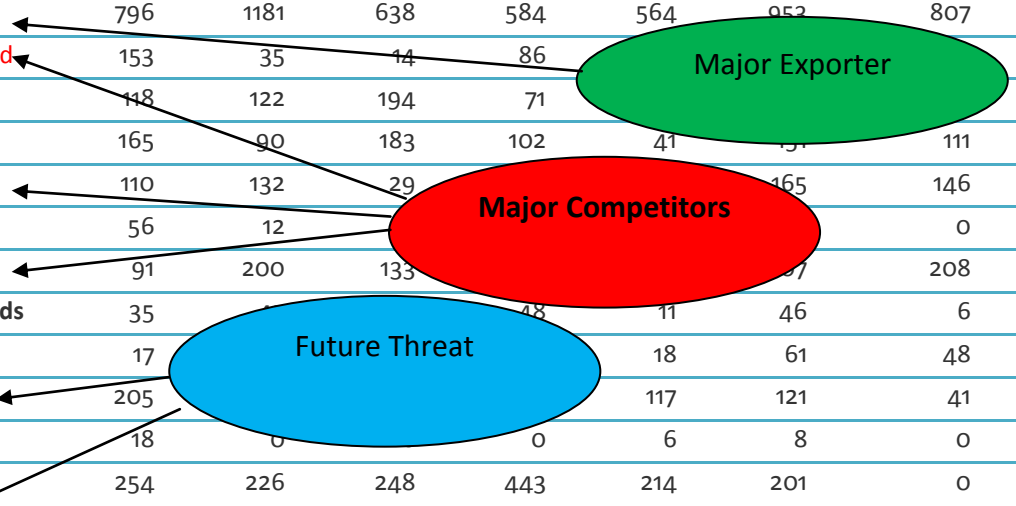


Denmark one of the another major importing country of Guar products is importing its 60 – 70 % of its guar from Spain. Portugal is another important country exporting to Denmark. Although India is exporting constantly but its amount is quite less as compare to Spain . Moreover
India has got the future threat from its neighboring country called Pakistan as it is also exporting constantly to Denmark.

15.9 Italy Importing Mucilages & thickeners derived from locust beans & seeds or guar seeds from Major Countries

Unit : US Dollar thousand

Exporters	Imported value in 2010-M01	Imported value in 2010-M02	Imported value in 2010-M03	Imported value in 2010-M04	Imported value in 2010-M05	Imported value in 2010-M06	Imported value in 2010-M07	Imported value in 2010-M08	Imported value in 2010-M09	Imported value in 2010-M10	Imported value in 2010-M11	Imported value in 2010-M12
World	2018	2202	1653	1873	1547	2067	1792	1505	2351	3128	2350	1154
India	796	1181	638	584	564	953	807	792	1159	1598	1368	788
Switzerland	153	35	14	86	[illegible]	[illegible]	[illegible]	52	175	235	80	111
Spain	118	122	194	71	[illegible]	[illegible]	[illegible]	64	100	71	80	60
Denmark	165	90	183	102	41	[illegible]	111	0	99	60	331	57
Pakistan	110	132	29	[illegible]	[illegible]	165	146	0	134	63	108	30
Austria	56	12	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0	18	6	25
Germany	91	200	133	[illegible]	[illegible]	[illegible]	208	86	157	124	113	25
Netherlands	35	[illegible]	[illegible]	48	11	46	6	20	72	38	16	20
Belgium	17	[illegible]	[illegible]	[illegible]	18	61	48	29	20	23	27	17
France	205	[illegible]	[illegible]	[illegible]	117	121	41	35	94	53	92	17
USA	18	0	[illegible]	0	6	8	0	0	6	62	17	5
United Kingdom	254	226	248	443	214	201	0	426	259	221	110	0

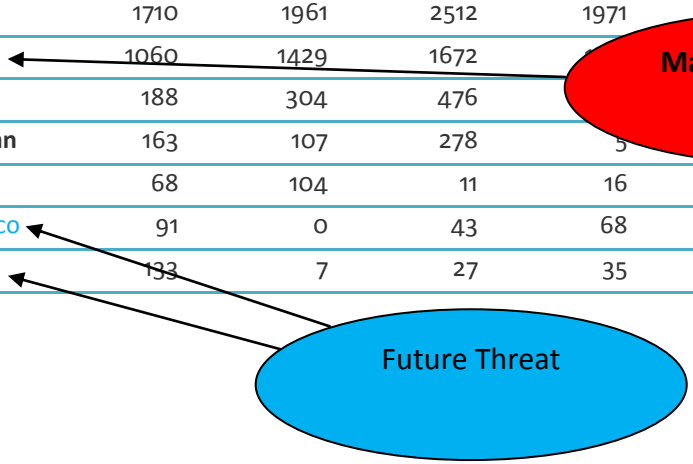


India is the largest exporters of Guar products to Italy. India contributing nearly 35 – 40% on first half of the year and increases its export to 60 – 70 % on later half of the year. It indicates that demand of guar products in Italy rises more on later half of the year. India is facing competition from Germany, Pakistan and Switzerland in Italian market. There are some future threats also like France and UK which are constantly supplying to Italian market.

15.10 Canada Importing Mucilages & thickeners derived from locust beans & seeds or guar seeds from Major Countries

Unit : US Dollar thousand

Exporters	Imported value in 2010-M01	Imported value in 2010-M02	Imported value in 2010-M03	Imported value in 2010-M04	Imported value in 2010-M05	Imported value in 2010-M06	Imported value in 2010-M07	Imported value in 2010-M08	Imported value in 2010-M09	Imported value in 2010-M10	Imported value in 2010-M11	Imported value in 2010-M12
World	1710	1961	2512	1971	[illegible]	1941	2811	2798	3072	3221	2686	2056
USA	1060	1429	1672	[illegible]	[illegible]	[illegible]	2119	1832	1919	2035	1966	1097
India	188	304	476	[illegible]	[illegible]	[illegible]	452	651	814	734	473	575
Pakistan	163	107	278	5	[illegible]	[illegible]	76	45	102	94	112	247
Italy	68	104	11	16	1	12	114	26	80	113	8	99
Morocco	91	0	43	68	65	0	0	136	103	146	5	0
Spain	133	7	27	35	286	10	10	72	7	22	115	0

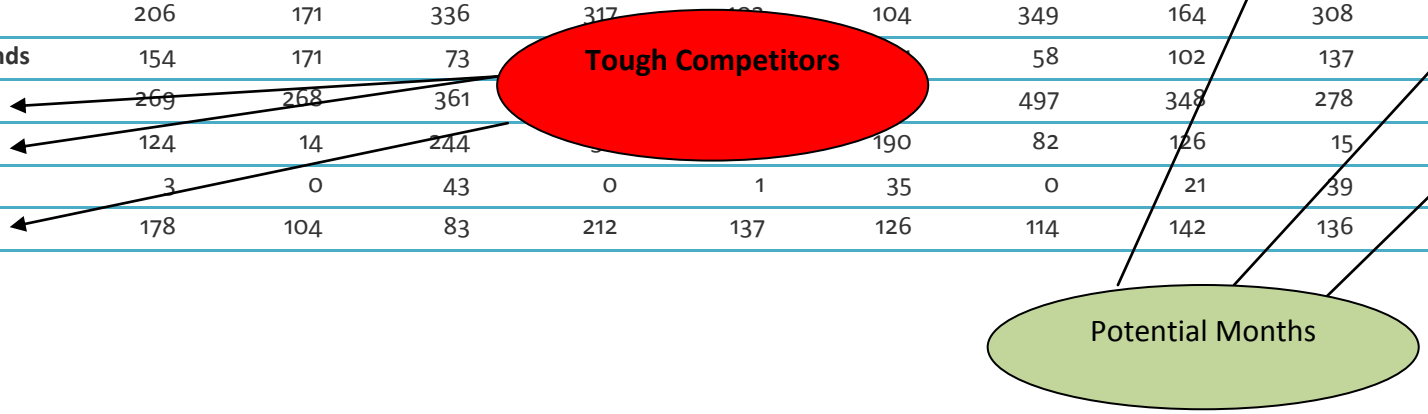


Due to its geographical advantage USA is the major exporter of Guar to Canada , contributing nearly 50-60% of total import of Canada. Although India is also exporting a good amount but at the same time India is facing threat from other competitors like Pakistan, Morocco, Spain. We can see that on later half of year demand of guar in Canada is increasing while of our future threats like Morocco and Spain are exporting less on later half of year . So, it's a potential time for Indian exporters to export more to Canada on later half of the year.

15.11 Belgium Importing Mucilages & thickeners derived from locust beans & seeds or guar seeds from Major Countries

Unit : US Dollar thousand

Exporters	Imported value in 2010-M01	Imported value in 2010-M02	Imported value in 2010-M03	Imported value in 2010-M04	Imported value in 2010-M05	Imported value in 2010-M06	Imported value in 2010-M07	Imported value in 2010-M08	Imported value in 2010-M09	Imported value in 2010-M10	Imported value in 2010-M11	Imported value in 2010-M12
World	949	753	1187	1015	608	816	1145	924	915	1259	1002	695
India	206	171	336	317	[illegible]	104	349	164	308	307	319	269
Netherlands	154	171	73	[illegible]	[illegible]	[illegible]	58	102	137	35	160	179
USA	269	268	361	[illegible]	[illegible]	[illegible]	497	348	278	275	266	144
Germany	124	14	244	[illegible]	[illegible]	190	82	126	15	159	21	54
France	3	0	43	0	1	35	0	21	39	15	2	46
Italy	178	104	83	212	137	126	114	142	136	95	213	0



Indian exporters are facing the tough competition in Belgium market from USA, Germany and Italy . These countries contribute nearly 55 - 65 % of total imports of guar in Belgium. Later half of the year can be consider as the potential months for Indian exporter to export in to Belgium market , as our competitor are exporting quite less as compare to first half of the year.

16.Competitive Analysis

16.1 Supply Scenario

- India is the major producer of Guar Seed followed by Pakistan and US. India's guarseed production fluctuates between years and has been around 2-6 lakh tons in the recent years. India's guar production in 2003, is estimated at around 6 lakh tons.
- India accounts for 80% of the total guar produced in the world. 70% of India's production comes from Rajasthan. The other producers are Gujarat, Haryana, Punjab, Uttar Pradesh and Madhya Pradesh.
- Taking the US, Australian, African crop the total world supply of Guar Split is around 4-5 lakh tons in a normal year. It may even increase to 8 lakh tons as has been visible in 2003-04.
- Guar is a crop of semi arid - sub tropical areas spread over the north and north west of India and east and south east of Pakistan. It is grown in arid zones of Rajasthan, some parts of Gujarat, Haryana, Madhya Pradesh. The main guar-growing region in India is Rajasthan.
- Guar is a rain fed monsoon crop, which requires 8-15 inch of rain in 3-4 spells and is harvested in October - November. It is sown immediately after first showers say in July and harvested around November each year. The crop yield is directly related to the monsoon. It requires a relative long growing season of 20-25 weeks.

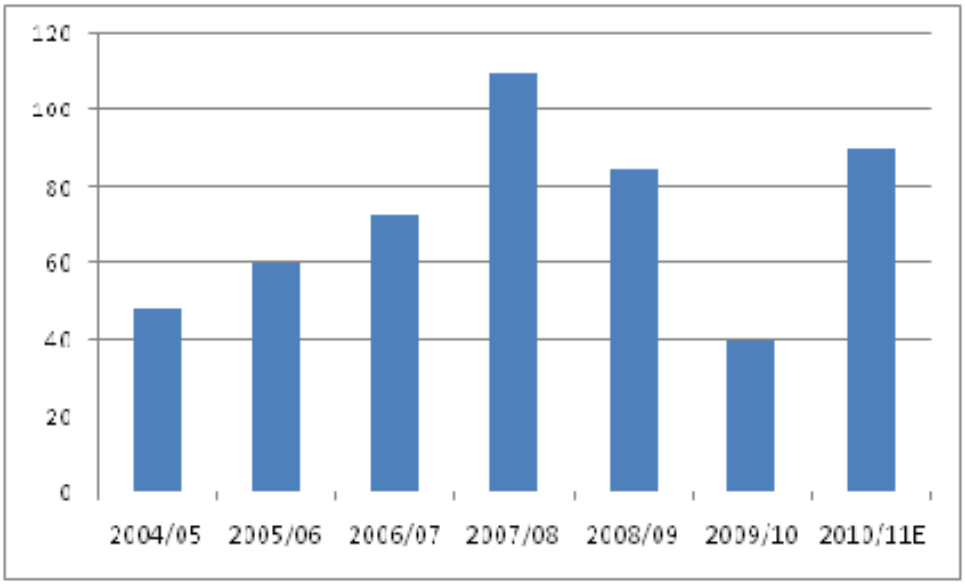
16.2 Demand Scenario

- World market for guar gum is estimated to be around 150,000 tons/year, 70% of which is produced by India and Pakistan.
- US consumption is estimated to be around 40,000 tons/year.
- The export from India is around 115,000 tons and the domestic market is of around 25,000 tons.
- India exported 33000 tons of guar gum refined split and 84000 tons of guar gum treated and pulverized in 2002-03, which together accounts for an export of 117000 tons of guargum exports valued above Rs. 300 crores.
- The main demand of guar seed originates from the US petroleum industry and also the oil fields of Middle East.

16.3 Market Influencing factors

- The production is directly related to monsoon. In Rajasthan, the rainfall fluctuates between years and thus results in high volatility in production and consequently on prices.
- While the demand is almost constant over the years, supply varies largely between years.
- The physical market of the commodity involves speculators and stockists. The commodity is subjected to a long storage period based on demand and market prices..
- There are no Government rules and regulations governing the production, distribution, marketing, exports or imports of the commodity and the market forces determine the prices.

Guarseed production



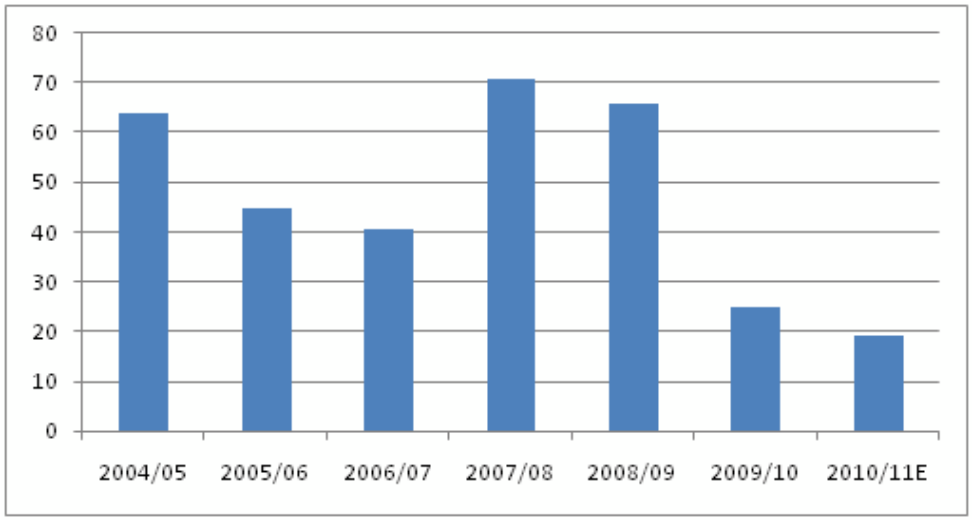
The current year crop is expected to be 90 lac bags v/s merely 40 lac bags of last year. The revival in Guar seed production was mainly on account of above average monsoon witnessed especially in the regions of North West India

S&D's Guarseed

	2004/05	2005/06	2006/07	2007/08	2008/09		
Production	48	60	73	110	85	40	90
Carry in	75	63.96	44.88	40.7	70.7	65.7	24.7
Total supplies	123	123.96	112.88	145.7	155.7	105.7	104.7
Exports	53.04	72.08	69.18	72	82	73	93
Local consumption	6	7	8	8	8	8	8
Ending stock	63.96	44.88	40.7	70.7	65.7	24.7	19

Looking at the supply demand scenario, the total supplies for 2010/11 is expected to reduce in fact after a great revival in production for the year 2010/11. Overall supplies of Guar seed for the year 2010/11 is expected to be 104.7 lac bags v/s 105.7 lac bags in 2009/10. The reason for such a miniscule drop in supplies after a revival in Guarseed production is thin carry over stock from previous year.

Guarseed stocks seen at multi year low for 2010

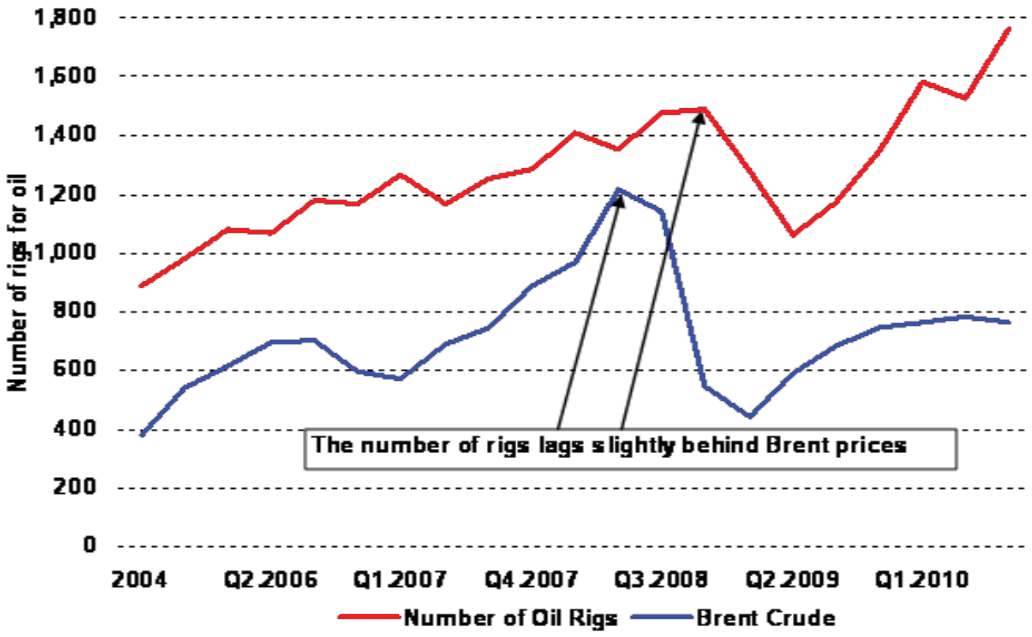


Guar seed carry stock for the year 2010/11 is likely to be at multi year low. For the year 2010/11 stock are expected to fall below 20 lac bags which lowest ending stock in the entire decade. The stock are expected to decline to below 20 lac bags from 34 lac bags in 2009/10 and as high as 65 lac bags in 2008/09.

Guar gum exports expected to revive going forward.

We have witnessed very good export demand of guar gum since last five months; this is resulting in further drop in carry forward stock of guar gum. Interestingly, number of oil rigs who have ramped up their production post recession has increased dramatically; this will result into higher than expected demand for Guar gum in coming months as one of the major applications of guar gum is maintenance of these oil wells. This is also one of the factors which will favor the bulls.

For the current year 2010/11 we expect Guar seed exports to revive and is likely to reach the levels of 93 lac bags



Moreover the seasonal demand for guar gum is at its peak during the months of Nov-March around the world. As the reason being quite simple the majority of the drilling activities of crude oils take place during these months.

Outlook

Going forward we expect guarseed and guargum prices to strengthen further due to low carry forward stocks, good export demand and seasonal demand for Guar gum. We expect guarseed prices to test Rs.2490-2600/Quintal and Guar gum to test Rs. 5508-5680/Quintal in next 4-5 months.

Annexure I

1) What is Guar?

Guar or cluster bean (sometimes clusterbean) (Cyamopsis tetragonoloba (syn. C. psoralioides), Fabaceae) is an annual legume plant that grows in semiarid regions. Guar is drought-tolerant and can be eaten green like snap beans, fed to cattle or used as a green manure. It bears many bean-like pods, each of which contains six to nine small, rounded seeds. The guar seed is typically made up of 40% to 46% germ, 38% to 45% endosperm, and 14% to 16% husk. The gum is obtained from the grounded endosperm.

2) What is Guar Gum?

Guar gum, a natural gum, is an edible thickening agent extracted from the guar bean. Guar beans have a large endosperm which contains galactomannan gum which forms a gel in water. This is commonly known as guar gum and is widely used Food and industrial applications. Guar gum has also proven a useful substitute for locust bean gum.

3) How is Guar Gum prepared?

Guar gum is prepared by removing the husk and germ portions before extracting the gum from the endosperm.

4) What is Guar Gum mainly used as?

Guar Gum is mainly used as natural thickener, emulsifier, stabilizer, bonding agent, hydrocolloid, gelling agent, soil stabilizer, natural fiber, flocculants and fracturing agent.

5) What are the properties of Guar gum?

Guar gum is soluble in hot and cold water but insoluble in most organic solvents and has strong hydrogen bonding properties. It has excellent thickening, Emulsion, Stabilizing and film forming properties. It is compatible with a variety of inorganic and organic substances including certain dyes and various constituents of food.

6) How Guar gum powder is prepared?

The seeds of Guar are split and the endosperm & germ is separated from the endosperm by sieving. Through heating, grinding & polishing process the husk is separated from the endosperm halves and the refined Guar Gum split are obtained. Through grinding process the refined Guar split are then treated and converted into powder.

7) Which are the grades of Guar Gum Powder?

There are two types of Guar Gum Powder

1) Food grade Guar Gum Powder
2) Industrial grade Guar Gum Powder

8) What are the factors to be considered for different grade Guar Gum Powder?

The grade of Guar Gum Powder depends upon: active matter content, granulation, viscosity, pH and degree of substitution.

9) What are the Physical Characteristics of Guar Gum Powder?

Guar Gum is a white to yellowish white powder and is nearly odorless. Fine finished Guar Gum Powder is available in different viscosities and granulometries depending on the desired viscosity development and applications.

10) In which food industries Guar gum is mainly used?

Guar gum is mainly used in food industries for frozen food products, baked food products, dairy products, sauces & salad preparations, confections, beverages, pet food etc. 11

11) In which other industries Guar gum is used?

Guar gum is widely used in textile industry, paper industry, explosives industry, oil and gas drilling, mining, construction, pharmaceutical, cosmetic industries and many other industries.

12) Which country mainly produced Guar?

Guar crop is produced in the India, Pakistan, Sudan, USA, South Africa, Brazil, Malawi, Zaire and Australia.

13) Which country is the major producer of Guar?

India is the major producer of Guar. India produces approximately 80% of world's total production. Pakistan follows India with 10 - 15% share in the world's total production.

14) What is the height of Guar Plant?

Guar plant is a rough to touch, bushy plant that has the ability to dwell even in the drought like conditions. This small, purple flowered, pointed leaved plant ranges from 2-9 feet in height. It is consumed as a bean, livestock fed and also in the form of manure in the fields.

15) What is the sowing and harvesting period of Guar?

- The sowing period is in the months July and August right after the first shower of the monsoon.
- The harvesting period is in the months October and November.

Guar is clearly a rain dependent crop. If the rainfall levels fluctuate during the year, it strongly influences the yield of the crop.

16) Who is the major exporter of Guar Gum?

India, Pakistan, USA, Italy, Morocco, Spain, France, Greece, Germany are the major exporter of Guar Gum.

17) Who is the major importer of Guar Gum?

Canada, China, Chile, Australia, Austria, Brazil, Germany, Italy, Japan, United Kingdom, USA, Ireland, Sweden, Greece, Portugal, Mexico are the major importer of Guar gum.

18) What is thickening agent or thickener? Is Guar gum used as a thickening agent?

Yes, Guar gum is widely used as a thickening agent.

Thickening agents, or thickeners, are substances which, when added to the mixture, increase its viscosity without substantially modifying its other properties, like taste. They provide body, increase stability, and improve suspending action. Thickening agents are often food additives.

Annexure II

1. Guar Extraction Methodology

Contagion of the natural gums available at present occurs mostly due to poor handling. There are various tools and system available through which natural gums can be extract completely hygienic from the tree.

2. Guar Scientific classification

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Fabales
Family: Leguminosae
Tribe: Indigofereae
Genus: Cyamopsis
Species: C. tetragonoloba
Botanical name: Cyamopsis tetragonolobus (L.)
Synonyms: Cyamopsis psoralioides L.
Part Used: Seeds
Vernacular Name: Guar

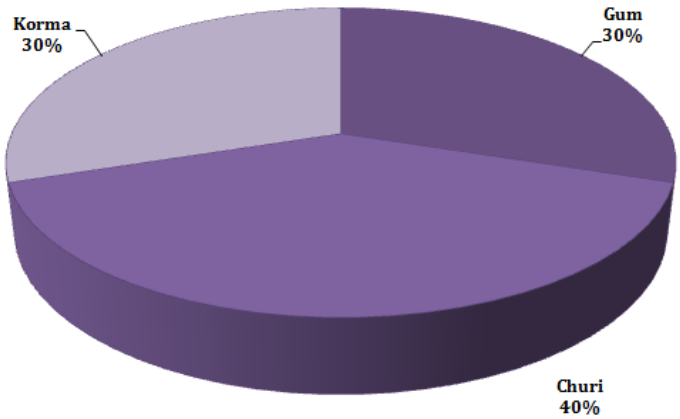
3. Guar Gum Components

Guar Gum mainly consists of hydrocolloidal polysaccharide with a high molecular weight, which consists of galactopyranose- and mannopyranose- units in glycoside linkage which can be chemically described as galactomannan.

4. Guar Gum Interpretation

5. Guar constituents

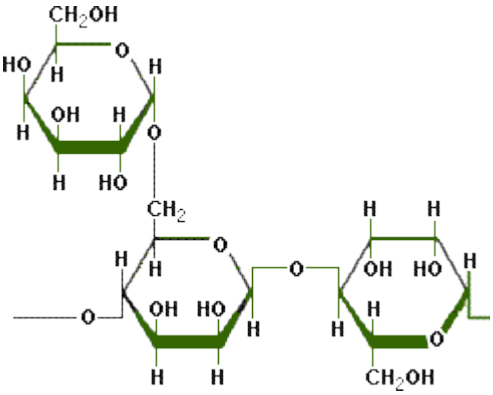
Approximately 90% of the guar seed is used for the production of guar gum and the rest is used for culinary purpose and cattle feed. Guar seed consists of three parts, germ (43-47%), endosperm (35- 42%) and the husk (14-17%). Guar seed extracts include Guar Split/Gum (30%), Korma (30%) and Churi (40%). Guar split/gum is further refined to guar powder for easy storage purposes. The by-product of guar gum industry is guar meal which is a source of protein and used as cattle feed.



The molecular structure reveals that GUAR GUM is a straight chain galactomannan with galactose on every other mannose unit. Beta 1-4 Glycosidic linkages couple the mannose units and the galactose side chains are linked through alpha 1-6. The mannose to galactose ratio has been estimated at 1.8 : 1 to 2: 1.

The molecular weight of Guar has reported as 1-2 x 10 6. Further studies indicate that Guar Gum is a rigid rod like polymer because of the beta linkage between the monomer units. Guar hydroxylsare in the CIS position. The CIS position is important since adjacent hydroxyl groups reinforce each other in hydrogen bonding reactions.

6. Guar Gum: Structure Diagram



Guar Gum has excellent cold water solubility because of the high galactose: mannose ratio. The special properties of GUAR GUM known in india make it most suitable for various industrial applications. Chemically, guar gum is a polysaccharide composed of the sugars galactose and mannose. The backbone is a linear chain of β 1,4-linked mannose residues to which galactose residues are 1,6-linked at every second mannose, forming short side-branches.

7. Guar Gum Properties

The most important property of guar gum is its ability to hydrate rapidly in cold water to attain uniform and very high viscosity at relatively low concentrations. Another advantage associated with guar gum is that it is a soluble in hot & cold water and provides full viscosity in even cold water. Apart from being the most cost-effective stabilizer and emulsifier it provides texture improvement, and water-binding; enhances mouth feel; and controls crystal formation. It is inert in nature. It is resistant to oil, greases, and solvents. Guar gum exporter provides guar gum for food additives, guar gum for food ingredients, guar gum for pet food additives, guar gum stabilizing, food grade guar gum, industrial grade guar gum and technical grade guar gum.

The main properties of Guar gum are

- It is soluble in hot & cold water but insoluble in most organic solvents.
- It has strong hydrogen bonding properties.
- It has excellent thickening, Emulsion, Stabilizing and film forming properties.
- At very low concentration, Guar gum has excellent settling (Flocculation) properties and it acts as a filter aid.
- It is non ionic and maintains a constant high viscosity over a broad range of ph.
- It is compatible with a variety of inorganic and organic substances including certain dyes and various constituents of food.
- The viscosity of Guar gum solution increase gradually with increasing concentration of Guar gum in water.
- The viscosity of Guar gum is influenced by temperature, ph, presence of salts and other solids.
- It has excellent ability to control rheology by economic water phase management.
- It forms highly viscous colloidal dispersions when hydrated in cold water. The time required for complete hydration in water and to achieve maximum viscosities depends on various factors i.e. the ph; temperature; grade of powder used; Equipment etc.

8 . Guar Gum: Physical Characteristics

- Guar Gum is a white to yellowish white powder and is nearly odorless. Fine finished Guar Gum Powder is available in different viscosities and granulometries depending on the desired viscosity development and applications.
- Guar Gum is a natural high molecular weight hydrocolloidal polysaccharide composed of galactan and mannan units combined through glycosidic linkages, which may be described chemically as galactomannan.
- Guar gum is a cold water soluble polysaccharide, consisting of mannose and galactose units. This ability to hydrate without heating makes it very useful in many industrial and food applications.
- Dissolved in cold or hot water, guar gum forms a slime of high viscosity. Guar's viscosity is a function of temperature, time, and concentration.
- Solutions with different gum concentrations can be used as emulsifiers and stabilizers because they prevent oil droplets from coalescing. Guar gum is also used as suspension stabilizer.

9. Guar Gum Chemical Properties

- Guar gum is an economical thickener and stabilizer. It hydrates fairly rapidly in cold water to give highly viscous pseudo plastic solutions of generally greater low-shear viscosity when compared with other hydrocolloids and much greater than that of locust bean gum.
- High concentrations (~ 1%) are very thixotropic but lower concentrations (~ 0.3%) are far less so.
- Guar gum is more soluble than locust bean gum and a better emulsifier as it has more galactose branch points.
- Unlike locust bean gum, it does not form gels but does show good stability to freeze-thaw cycles.
- Guar gum shows high low-shear viscosity but is strongly shear-thinning. Being non-ionic, it is not affected by ionic strength or pH but will degrade at pH extremes at temperature for e.g. pH 3 at 50°C. With case in, it becomes slightly thixotropic forming a biphasic system containing casein micelles.
- Guar gum retards ice crystal growth non-specifically by slowing mass transfer across solid/liquid interface.

- Guar Gum is known as one of the best thickening additives, emulsifying additives and stabilizing additives.
- Guar gum has a polymeric structure, containing several hydroxyl groups. The various derivatives or industrial grades of Guar gum are manufactured by reaction of these hydroxyl groups with chemicals that aid in:
    - Dispersion
    - Control Viscosity
    - Causing Gelling
    - Act as preservatives

10. Guar Gum Solubility and viscosity

The most important characteristic of guar is its ability to be dispersed in water and hydrate or swell rapidly and almost completely in clod water to form viscous colloidal dispersions or sols.The viscosity attained is dependent on time, temperature, concentration, pH, rate of agitation and practical size of the powdered gum used. The lower the temperature lower the rate at which viscosity increases and the lower the final viscosity.Above 80º the final viscosity is slightly reduced. The finer guar powders swells more rapidly than coarse powdered gum.

Guar gum is more soluble than locust bean gum and is a better emulsifier as it has more galactose branch points. Unlike locust bean gum, it is not self-gelling. However, either borax or calcium can cross-link guar gum, causing it to gel. In water it is nonionic and hydrocolloidal. It is not affected by ionic strength or pH, but will degrade at pH extremes at temperature (e.g. pH 3 at 50°C). It remains stable in solution over pH range 5-7. Strong acids cause hydrolysis and loss of viscosity, and alkalies in strong concentration also tend to reduce viscosity. It is insoluble in most hydrocarbon solvents.

Guar gum shows high low-shear viscosity but is strongly shear-thinning. It is very thixotropic above concentration 1%, but below 0.3% the thixotropy is slight. It has much greater low-shear viscosity than that of locust bean gum, and also generally greater than that of other hydrocolloids. Guar gum shows viscosity synergy with xanthan gum. Guar gum and micellar casein mixtures can be slightly thixotropic if a biphase system forms.

11. Guar Gum Manufacturing Process

Guar Gum powder is manufactured by mechanical extraction of endosperm (Galactomannan) from the guar seed.

Guar seeds are separated from the plant and dried. Refined Guar splits are first obtained by roasting, dehusking, and polishing. These splits are then pulverized and tailor made in various mesh sizes and of required viscosity for usage in different industries. MG Ingredients gets their guar gum contract manufactured. The plant is ISO:9001 and HACCP certified and uses state of the art technology and equipment at all stages of production to ensure high and consistent quality.

Depending upon the requirement of end product various processing techniques are used. In India the commercial production of Guar gum is normally undertaken by using process of roasting, differential attrition, sieving and polishing.

The stage wise process of manufacturing food grade guar gum is as under. It is very important to select guar split in this process. The split will be screened to clean and then it will be soaked to prehydrate in a double cone mixer. Prehydrating stage is very important in the process as it derives the rate of hydration of the final product.

The soaked splits, which has reasonably high moisture content, will be passed through Flacker to take them. The flaked guar split will be ground to desired particle size followed by drying of the material. The power will be screened through rotary screens to deliver required particle size. The oversize will be either recycle to main Ultra fine or regrind in separate regrind plant, as per viscosity requirement.

This stage helps to reduce the load at the grinder. The soaked splits are difficult to grind. Direct grinding of those generates more heat in the grinder which is not desired in the process as it results in insoluble or reduced hydration of the product. Through heating, grinding & polishing process the husk is separated from the endosperm halves and the refined Guar Gum split are obtained. Through grinding process the refined Guar split are then treated and converted into powder.

During the split manufacturing process, husk & germ are obtained which are used as a cattle feed as they are rich in protein. It is widely sold in the international market as “Guar Meal” and has contents of “Oil & Albuminoids”. These contents are about 50% in germ whereas it is about 25% in husks. Quality of the food grad guar gum powder is defined from its particle size, rate of hydration and the microbial in it. E412 guar gum is an important natural food supplement with high nutritional value.

12. Guar Gum: Stage wise Process

12.1 Guar Seed

- First, the pods are dried in sunlight, manually separated from the seeds.
- The seeds are supplied to the industry for processing.
- Guar by-products, churi and korma are used for Cattle feed.
- The seeds are crushed to eliminate the germ; the endosperm is dehusked, milled and screened to obtain the ground endosperm (native guar gum). The guar gum may be washed with ethanol or isopropanol to control the microbiological load (washed guar gum).

Annexure III

1. Importance & Uses

Guar is an important source of nutrition to animals and humans and is consumed as a vegetable and cattle feed. Apart from being consumed as feed for animals or vegetable for human consumption, it is used as thickener in cosmetics, sauces and salad dressings. Industrially it is used in mining, petroleum drilling and textile manufacturing.

Human consumption

- Immature pods are dried, salted and preserved for future use
- Immature pods are dried and fried like potato chips
- Green pods are cooked like French seeds
- Mature seeds are used as an emergency pulse in time of drought

Cattle feed

- Plants are cut and fed as green forage.
- Seeds are boiled in a large kettle and fed to cattle a high protein source.

Medicinal purposes

- Leaves are eaten to cure night blindness.
- Seeds are used as a chemotherapeutic agent against smallpox.
- Seeds are used as laxative.

Industriusage

- Guar gum is used in paper manufacturing, textiles, printing, cosmetics and pharmaceuticals.
- Guar gum is used as a thickening agent and additives in food products such as instant soups, sauces, processed meat products, baked goods, milk and cheese products, yoghurt and ice-creams.

By-Productof Guar Seed after processing.

By-Product	Weight (in %)
Split/gum	29
Churi	30
Korma	37
Others	4

2. Technology Process

Plant

- Guar split is fed in the pneumatic system to feed in to the turbo screen that is suggested at the high of plant. After the initial screening which is done to remove any foreign matter, the monitored material is stored in a storage hopper. The material then is taken by gravity to double cone mixer as and when required for pre-hydrating of guar splits.
- The pre hydrated guar splits are at a time sent by gravity to hopper of flacker that crushes the guar splits and uniformly moves it to the ultra fine grinder, which grinds the material without generating too much heat. The grinded material is then fed into a dryer.
- Centrifugal screen is used to screen the material, which is again passed through turbo screens for additional precautions, separating the oversize material in terms of grade and particle size. The oversized particle will be sent to the same grinder for recycling, and the process will be repeated.
- The material that passes from all the screens is sent to Nuta mixer separately by gravity for blending and assembling it to a uniform lot, which is then tested and packed.

Guar Gum Plant

3.Manufacturing Process

These process treatments aimed to improve the flavor, functionality and stability of guar gum as well as yield a variety of new applications. The processes included the following operations: done singly or in combination: milling, sifting, deodorization, hydrolysis and chemical modification of the galactomannan. Hydrolysis was done using an enzymatic breakdown or by pH control. Chemical conversion included an incorporation of a lipophilic moiety. Evaluation of the products involved sensory evaluation, rheological study and end-use applications as in bakery products, oil-in-water emulsions, cereal products, dressings, sauces, fiber sources and many others.

- Guar seed pods are first sun dried and thrashed, to separate seeds from them. These seeds are then processed in industry. The by products of guar (Korma, Churi) are utilized for cattle feed.

- The seeds are then pulverized and the germ is separated from endosperm, which contains about 80% Galactomannan (gums), and polysaccharides. Two halves of the endosperm are obtained from each seed, known as Un-dehusked Guar Splits.
- When the polished endosperm are removed and separated from the fine layer of fibrous material a husk and refined Guar splits are obtained. These refined splits are then pulverized and treated and processed using tailor made technology for specialty grade products for usage in industries specified. After pulverization, sieving is done to get the required mesh size i.e. fine, coarse, etc.
- The Guar gum is mechanically extracted by roasting, differential attrition, sieving and polishing of Guar seeds. The sieved gum is then passed through the blenders to make it homogenous and later it is packed for marketing.
- The gum is refined to make yellowish white powder as per the quality specifications required by consuming industries and grades specified. It is consumed in this form world wide.

The modern high technology units employ hammer /or Jet mills and other equipment's using the latest techniques to produce powders with higher fineness, finer colloid formation, higher water absorption and consistency, especially as per Pharmaceuticals, Cosmetics and Food processing industries' requirements

4. Guar Gum Powder Grades

Grading

Manufacturers define different grades and qualities of guar gum by the particle size, the viscosity that is generated with a given concentration, and the rate at which that viscosity develops. Coarse-mesh guar gums will typically — but not always — develop viscosity more slowly. They may achieve a reasonably high viscosity, but will take longer to achieve. On the other hand, they will disperse

The physical and performance characteristic of specific guar grades are determined by mechanical treatment before and after the endosperm is milled to its final, light tan flour form. Guar grades hydrate in both cold and hot water to yield viscous solutions.

Different guar gum powder grades are manufactured as per its industrial applications; for thickening, stabilizing, texturizing, enhancing suspension and flow control properties for industrial products, food products and processes.

For industrial use, addition of desirable qualities such as dust elimination for powdered products, the manufacture of stronger pellets, better flocculation or slip aids, for your processes or finished products.

Two types of Guar Gum Powder

1) Food grade Guar Gum Powder: for used in industries like food, pharmaceutical, cosmetic etc

Particle Size	**Viscosity Range (Cps)**
200 MESH -200 90% MIN.	2000-7500
300 MESH -200 99% MIN.	3500-5000

2) Industrial grade Guar Gum Powder: For used in industries like paper,mining, explosive, Oil-drilling etc

Particle Size	**Viscosity Range (Cps)**
100 MESH -100 80% MIN	3000-6000

The grade of Guar Gum Powder depends upon:

- Active matter content
- Granulation
- Viscosity
- pH
- Degree of substitution

5.Guar Gum Powder Standards

Quality testing parameters include testing of the factors like:

1. A.I.R. (Acidic Insoluble Residue)
2. Moisture
3. Viscosity
4. Content of Ash
5. Size of the Particle
6. Odour
7. Protein
8. Filterability
9. Gum Content
10. Color
11. Fibre
12. Granulation
13. Insoluble Residue
14. Fat Content
15. pH
16. Heavy Metals
17. Arsenic
18. Lead

Annexure IV

Measures Applicable to Guargum from India

The Commission Decision imposing special conditions on guar gum originating from India requires that all consignments of guar gum or products containing guar gum at significant amounts originating in or consigned from India, which left India after 4 May 2008 and imported into the Community intended for human or animal consumption, shall be accompanied by an original analytical report issued by a

laboratory accredited according EN ISO/IEC 17025 for the analysis of PCP in food and feed or by a laboratory that is pursuing the necessary accreditation procedures and which has adequate quality control schemes in place accompanying the consignment demonstrates that the product does not contain more than 0.01 mg/kg pentachlorophenol (PCP). The analytical result must be reported with the expanded measurement uncertainty. The analytical report shall be endorsed by a representative of the competent authority from the country where the
laboratory is located.

As regards analytical reports endorsed by the competent authority of India, according the findings of the FVO, the Vimta Labs, Hyderabad, Andhra Pradesh is the only laboratory in India which fulfils the requirement of accreditation and/or having in place the appropriate quality control schemes. As regards the laboratories in the European Union, in order to reduce the administrative burden, it was agreed that a list of laboratories within the EU authorized to perform the PCP analysis would be established and put on the SANCO website. Analytical reports from these laboratories are considered to be endorsed automatically by the competent authority of the country where the laboratory is located.

Analytical reports from other laboratories in the EU need to be each individually endorsed by the competent authority of the country where the laboratory is located in order to be acceptable for authorization of import
of guar gum or products containing guar gum originating from India .

EU Laboratories Addresses for Guargum Testing

Laboratories from which the analytical reports are considered to be endorsed automatically by the competent authority of the country where the laboratory is located.

BELGIUM

Fytolab C.V.B.A
Technologiepark 2/3
9052 Zwijnaarde-Gent

SGS-Belgium
Haven 407, Polderdijkweg 16
2030 Antwerpen

Wetenschappelijk Instituut Volksgezondheid (WIV) – Institut Scientifique de Santé Publique (ISP)
Rue J. Wytsmanstraat 14
1050 Brussel

BULGARIA

No laboratories designated by the competent authority of Bulgaria

CZECH REPUBLIC

State Veterinary Institute Prague (Státní veterinárnhi ústav Praha)
Address: Sídlištni 24
163 05 Praha 6
Czech Republic
Contact person: Jan Rosmus
Phone: +420 251 03 1 335
Fax: +420 25 1 03 1 335
E-mail: jan.rosmus@svupraha.cz

Institute of Public Health Ostrava - Centre of Hygienic laboratories
(Zdravotni ústav se sídlem v Ostravě: - Centrum hygienických laboratoří)
Address: Dobrá 240
739 51 Frýdek-Místek
Czech Republic
Contact person: Tomáš Ocelka
Phone: +420 558 601 452
Fax: +420 558 630 455
E-mail: tomas.ocelka@zuova.cz

DENMARK

Niels Ellermann
Laboratoriechef
Laboratorium for Foder og Gødning
Plantedirektoratet
Tlf: (+45) 45 26 36 00
Direkte (+45) 45 26 38 10
mail: nel@pdir.dk

Head of Laboratory
Laboratory for Feed and Fertilizers
The Danish Plant Directorate
Tel: (+45) 45 26 36 00
Direct: (+45) 45 26 38 10 e-
e-mail: nel@pdir.dk

Web: www.pdir.dk Web: www.pdir.dk

GERMANY

Name des Labors	Anschrift	Tel./Fax/Mail
muva kempten	Ignaz-Kiechle-Str. 20-22 87437 Kempten	Tel.: +49 831 5290-385 Fax: +49 831 5290-199 Hans.tober@muva.de
Institut Nehring GmbH	Heesfeld 17 38112 Braunschweig	Tel.: +49 531 238 990 Fax: +49 531 238 9977 info@institut-nehring.de
Wessling Laboratorien GmbH	Haynauer Straße 67a 12249 Berlin	Tel.: +49 30 77507 403 Fax: +49 30 77507 555 produktanalytik.berlin@wessling.de
Institut Fresenius GmbH	Tegeler Weg 33 Haus B4 10589 Berlin	Tel.: +49 30 34607 703 Fax: +49 30 34607 799 birgit.christall@institut-fresenius.de
GfL - Gesellschaft für Lebensmittel-Forschung mbH	Landgrafenstraße 16 10787 Berlin	Tel.: +49 30 263 9200 Fax: +49 30 263 92025 info@gfl-berlin.com
Oekometric GmbH	Bernecker Str. 17-21 95448 Bayreuth	Tel.: +49 921 72633 12 Fax: +49 921 72633 99 rottler@oekometric.de
Institut Kirchhoff Berlin GmbH	Albestraße 3-4 D-12159 Berlin	Tel.: +49 30 85 10 28 - 45 Fax: +49 30 85 10 28 - 99 eb@institut-kirchhoff.de
Eurofins Analytik GmbH Wiertz Eggert Jörissen	Neuländer Kamp 1 21079 Hamburg	Tel.: +49 40 49294 720 Fax: +49 40 49294 111 katrinhoenecke@eurofins.de

Name des Labors	Anschrift	Tel./Fax/Mail
LUFA-ITL GmbH	Dr. Hell-Str. 6 24107 Kiel	Tel.: +49 431 1228 -330 u. 417 Fax: +49 431 1228 498 kerstin.fleischer@lufa-itl.de stephanie.nagorny@lufa-itl.de
GBA - Gesellschaft für Bioanalytik Hamburg mbH	Cuxhavener Str. 42 21149 Hamburg	Tel.: +49 40 7971 7254 Fax: +49 40 7971 7227 f.schuett@gba-hamburg.de

Food GmbH Jena Analytic Consulting	Orlaweg 2 07743 Jena	Tel.: +49 3641 30963 30 Fax: +49 3641 30963 38 info@food-jena.de
Eurofins Dr. Specht Laboratorien GmbH	Großmoorbogen 25 21079 Hamburg	Tel.: +49 40 30086 0 Fax: +49 40 30086 101 specht@eurofins.de
Sofia GmbH	Rudower Chaussee 29 12489 Berlin	Tel.: +49 30 677 9856 Fax: +49 30 677 98588 sofia@sofia-gmbH.de
Wessling Laboratorien GmbH, Labor Bremen	Bauernland 7 28259 Bremen	Tel.: +49 421 57209 22 und 24 Fax: +49 421 57209 23 labor.bremen@wessling.de
Wessling Laboratorien GmbH	Oststraße 6 48341 Altenberge	Tel.: +49 2505 890 Fax: +49 2505 89 119 umweltanalytik@wessling.de
Mas I Münster Analytical Solutions GmbH	Technologiepark Münster Mendelstr. 11 48149 Münster	Tel.: +49 251 980 2409 Fax: +49 251 980 2401 s.hamm@mas-tp.com
Eurofins/GfA	Otto-Hahn-Str.22 48161 Münster	Tel.: +49 2534/807-154 Fax: +49 2534/807-110 rainergruemping@eurofins.de Tel.: +49 2534/807-234 Fax: +49 2534/807-110 manfreddehoogd@eurofins.de

ESTONIA

No laboratories designated by the competent authority of Estonia

REECE

Name of the Laboratory	Address	Contact Person

Mass Spectrometry and Dioxin Analysis Lab. National Centre for Scientific Research "Demokritos"	153 10 Ag. Paraskevi, Athens-GREECE	Dr. Leondios Leondiadis, Head of the Mass Spectrometry and Dioxin Analysis Laboratory Tel. +30-210-6503610 Fax +30-210-6536873 e-mail: leondi@rrp.demokritos.gr
General Chemical State Laboraty (GCSL) Division of Environment-Laboratory	16, An. Tsocha Str. 11521 Athens Greece	Dr. Xaralampos Alexopoulos Tel: +30-210-6479427 Fax +30-210-6479156 e-mail: gxk-environment@ath.forthnet.gr

SPAIN

No laboratories designated by the competent authority of Spain

FRANCE

Laboratoire du SCL (Service Commun des Laboratoires) de Rennes
35 bis rue Antoine Joly 3500 Rennes.
Contact : Mme Joelle BAYLE
labo35@scl.finances.gouv.fr

IRELAND

No laboratories designated by the competent authority of Ireland

ITALY

Neotron Spa
Stradello Aggazzotti, 104
41100 MODENA - ITALY
Tel:+39 059 461711
Fax:+39 059 461777
@mail: customercare@neotron.it

CYPRUS

No laboratories designated by the competent authority of Cyprus

LATVIA

No laboratories designated by the competent authority of Latvia

LITHUANIA

No laboratories designated by the competent authority of Lithuania

LUXEMBOURG

No laboratories designated by the competent authority of Luxembourg

HUNGARY

Name of laboratory in English		Central Agricultural Office, Food and Feed Safety Directorate, Central Feed Investigation Laboratory, National Reference Laboratory, Budapest
Name of laboratory in Hungarian		Mezőgazdasági Szakigazgatási Hivatal (MgSzH) Élelmiszer- és Takarmánybiztonsági Igazgatóság, Központi Takarmányvizsgáló Laboratórium – Nemzeti Referencia Laboratórium, Budapest
Address		H-1144 Budapest, Remény u. 42. Hungary
Telephone		+(36-1)383-5195
Fax		+(36-1)467-0461
E-mail		kozplab@ommi.hu
Name	of the Contact person	Judit Marth-Schill
Position		Head of Laboratory
Telephone		+(36-1)383-5195
Fax		+(36-1)467-0461
E-mail		kozplab@ommi.hu

MALTA

No laboratories designated by the competent authority of Malta

THE NETHERLANDS

No laboratories designated by the competent authority of The Netherlands

AUSTRIA

Österr. Agentur für Gesundheit und Ernährungssicherheit
Kompetenzzentrum Rückstandsanalytik
Herr Dr. Friedrich FILA
e-mail: friedrich.fila@ages.at

Spargelfeldstrasse 191
A-1226 Wien

POLAND

No laboratories designated by the competent authority of Poland

ROMANIA

No laboratories designated by the competent authority of Romania

SLOVENIA

Zavod za zdravstveno varstvo Maribor / Institute of Public Health Maribor
Prvomajska 1
2000 Maribor
Slovenia

Mr. Stanko Brumen
stanko.brumen@zzv-mb.si tel.
+386 2 4500 100
fax: +386 2 4500 227

SLOVAKIA

No laboratories designated by the competent authority of Slovakia

FINLAND

Customs Laboratory
P.O.Box 53
FI-02151 ESPOO

tel.+350 20 492 3267/Kalevi Siivinen
kalevi.siivinen@tulli.fi

SWEDEN

Eurofins Food & Agro Sweden AB (Analycen) Box
905
SE-531 19 Lidköping
SWEDEN
Tel: +46 510 88 700

UK

Simon Baty
Business Development Manager
Central Science Laboratory
Sand Hutton

York
YO41 1LZ United
Kingdom

Phone: +44 (0)1904 462531
Mobile: +44 (0)7711 112668
Fax: +44 (0)1904 462111
Email: s.baty@csl.gov.uk

NORWY

Norwegian Institute for Agricultural and Environmental Research, Plant health, Department of Pesticide Chemistry
Bioforsk Plantehelse, Seksjon Pesticidkjemi
Høgskoleveien 7
1432 Ås
Norway

Head of laboratory: Børge Holen E-mail: borge.holen@bioforsk.no Tel: +47 975 24 476
Fax: +47 64 94 61 10
Web: www.bioforsk.no

Annexure V

List of Indian Exporters of Guargum

S. No.	RCMC No.	Exporter Name	Address	City	State	Telephone No.	Email
1	113	HINDUSTAN GUM & CHEMICALS LTD	BIRLA COLONY,	BHIWANI	Haryana	243891	hichem@vsnl.com
2	50912	RAMA INDUSTRIES	NR. GIDC PATAN HIGHWAYDEESA, BANASKANTHA,	DEESA,	Gujarat	91-2744-26762,309393	info@ramagum.com
3	662	JAI BHARAT GUM & CHEMICALS LTD	SIWANI MANDI,	DIST. BHIWANI,	Haryana	01255-277524, 277824	rajeshkedia@jbgc.com
4	160	SHREE RAM INDUSTRIES	C-80 MARUDHAR INDUSTRIAL AREABASNI IIND PHASE-II	JODHPUR	Rajasthan	+91.291.2744100	sri@sriguargum.com
5	157707	SHREE RAM GUM CHEMICALS LTD.	C-79, M. I. .A BASNI 2ND PHAS	JODHPUR	Rajasthan	0291-2740240	shreeram@shreeramgum.com
6	997	ADARSH GUAR GUM UDYOG	OPP KRISHI UPAJ MANDI INDUSTRIAL AREA	BARMER	Rajasthan	220747	adarshguar@adarshguargum.com
7	155567	TIKU RAM GUM & CHEMICALS PVT.LTD.	DHANI RAMJAS,SIWANI MANDI,	BHIWANI,	Haryana	9.99E+09	trgc_pltd@yahoo.com
8	333	LOTUS GUMS & CHEMICALS	G-657, M.I.A. IIND PHASE BASNI,	JODHPUR	Rajasthan	2740374	lotus@ndf.vsnl.net.in
9	547	SARDA GUMS & CHEMICALS	14-16, OVALWADI, VITHALWADI,	MUMBAI	Maharashtra	22401073 / 22407155	sardagum@bom3.vsnl.net.in
10	159468	CAREMOLI INDIA PVT. LTD.	113, PWD COLONY,	JODHPUR,	Rajasthan	0291-2744100	m.soni@caremoli_india.com
11	150842	SHREE VIJAYLAXMI ENTERPRISES,	E-106(A), M.I.A. 2ND PHASE ,	BASNI, JODHPUR,	Rajasthan	+91 291 2747142/09829021864	vijaycol@hotmail.com
12	158139	MAXAM INDIA PRIVATE LIMITED	209, 2ND FLOOR, ANSALS VIKAS DEEP	LAXMI NAGAR DISTRICT CENTRE	Delhi	011-22444846	rverma@maxam_int.in

13	159548	SHREE RAM COLLOIDES PVT. LTD.	E-1-16-17, AGRO FOOD PARK,	BORANADA, JODHPUR,	Rajasthan	0291-2748702	srcolloid@gmail.com
14	2241	RAJASTHAN GUM INDUSTRIES	F-115 MARUDHAR INDUSTRIAL AREBASNI - II,	JODHPUR	Rajasthan	2741059	rgi@aargum.co.in
15	437	H B GUM INDUSTRIES PVT LTD	86 MASJID BUNDER ROADMUMBAI	MUMBAI	Maharashtra	3738016 3752136 3752137	hb1@vsnl.com
16	154402	SARDA STARCH (P) LTD.,	14/16, OVALWADI, VITHALWADI,	MUMBAI	Maharashtra	22407155	mo@sardagums.com
17	158242	PANKAJ GUM & CHEMICAL INDUSTRI	F-146-B, MARUDHAR INDL. AREA,	JODHPUR,	Rajasthan	0291-2740864, 5120483	pankaj_m_h@yahoo.com
18	5186	SHREE INDIA-SINO GUMS PVT.LTD	F-37,MARUDHAR INDUSTRIAL AREA	BASNI PHASE 1, JODHPUR	Rajasthan	0291-2748701/2740747/2740240	office@shreeindiagum.com
19	151496	JAIRAMDASS KHUSHIRAM	PLOT NO.5,SECTOR-19C,OPP. PUNJABNATIONAL BANK, VASHI	NEW MUMBAI,	Maharashtra	022-27891651	aggarwal@bom2.vsnl.net.in
20	155389	SANKALP	401/A, RAVJI PREMJI APARTMENT,262 S.V. ROAD, BORIVALI - WEST	MUMBAI,			mithilesh@sankalpworld.com
21	184	NIMEX TRADING CORPN	17/2ND FLOOR, TOPIWALA MANSION, 93/97, MOHAMEDALI ROAD,	MUMBAI	Maharashtra	23421441	nimex@vsnl.com
22	152852	NANI AGRO FOODS (P) LTD.,	32, OTTUKKARA CHINNAIYA STREETPOST BOX NO.549	ERODE	Tamil Nadu	0424-2214111/2214011/2217195	aditya501@eth.net
23	5394	SHREE-RANIE GUM & CHEMICAL(P).	F-239,MARUDHAR INDL.AREABASNIJODHPUR	JODHPUR	Rajasthan	740240/ 740192	sri@sriguargum.com

List of Potential Buyers of Guargum

S No.	Company Name	City	Country	Phone	product	Email id
1	NATURAL POLYMER INDUSTRIES (PVT) LTD	Karachi	Pakistan	92-21-5805581	Guargum	texint@attglobal.net
2	JASCO TRADING INC	Plano	United States	1-866-920-2955	Guargum	inquiry@jasco-trading.com
3	Pearltainer FZE	Sharjah	United Arab Emirates	971-6-5536205	Guargum	james@pearltainer.com