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Groundnut Value Chain Study in India with Special Emphasis on High Oleic Cultivars

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Groundnut Value Chain Study in India with Special Emphasis on High Oleic Cultivars

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INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS

2023

Contents

1. Introduction

The market structure in developing countries has been rapidly changing since 1950, particularly in the agriculture and food sector[1]. Crop improvement scientists have immensely contributed to the Green Revolution by fulfilling actors' demands in the cereal food supply chain. Higher growth in production enabled the country not only to achieve self-sufficiency but also to create primary and secondary markets. This increased productivity has moved agriculture from subsistence to market-led systems where markets were influenced by emerging segments and their needs and preferences. A growing population, consumerism, urbanization, changing lifestyles, etc., have created an opportunity for stakeholders in the market chain to express their needs and preferences precisely. Reciprocally, this deviation of work – from developing agro-climatic plant to creating market-led varieties – has formed an avenue for crop improvement scientists to collect needs and preferences from all their value chain actors (growers to consumers), and eventually translate them into breeding decisions (Ragot et al. 2018)[2], i.e., developing a demand-led plant variety design (Yao et al. 2017)[3].

The demand-led breeding approach enabled crop improvement scientists to develop higher-performing varieties that meet customer requirements and market demand (Persley et al. 2017)[4]. However, markets in developing countries were characterized by dual value chains (informal and formal/modern) where information flow is in both directions, i.e., where markets inform producers of price, quantity and quality needs, product handling, and technology options, while producers inform processors and markets on production quantities, locations, timing and production issues (Norton 2014)[5]. Hence a better understanding of the structure of crop value chains is required for designing a new variety; and goals and objectives have to be set based on the needs of the value chain actors or with a specific focus on individual trait improvement (Pangirayi et al. 2017)[6]. To be more precise, scientists should have an understanding on the various categories of clients in the value chain, their preferences, and preparedness to pay for it (Pangirayi et al. 2017). This research note presents the preferences of products and the preparedness to pay by the value chain actors of groundnut in India with special focus on Gujarat State. The end objective of the research is to help the breeders in a basic understanding of groundnut market traits and the scope for new varietal designing or further improvements in existing varieties. Furthermore, feedback about high oleic cultivars were also captured through brainstorming and summarized in this report.

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1 Vettas N. 2006. Market control and competition issues along the commodity value chain. Pages 9-26 in Fao Commodities and Trade Division workshop on Governance, Coordination, and Distribution along the Commodity Value Chains, 4-5 April 2006, Rome, Italy.

2 Ragot M, Bonierbale M and Weltzien E. 2018. From market demand to breeding decisions: A framework. Lima, Peru: CGIAR Gender and Breeding Initiative. GBI Working Paper No. 2.

3 Yao NK, Kimani P, Hussein S, and Tongoona P. 2017. Demand-led variety design: Make plant breeding in Africa a business model responsive to market demand. Poster. Proceedings of the International Tropical Agriculture Conference 2017 (TropAg2017), Brisbane, Australia, 20-22 November 2017.

4 Persley GJ and Anthony VM. 2017. The business of plant breeding: Market-led approaches to new variety design in Africa. Wallingford, UK; and Boston: CABI. 210 pp.

5 Norton Roger. 2014. Agricultural value chains: A game changer for small holders | Devex. Retrieved June 17, 2021, from https://www.devex.com/news/agricultural-value-chains-agame-changer-for-small-holders-83981

6 Pangirayi Tongoona, Danquah Agyemang and Danquah Eric Y. 2017. Understanding client needs.Book 7. Pages 63-84 in The business of plant breeding (Persley GJ and Anthony VM, eds.).

2. Material and Methods

The groundnut crop was purposively selected for the present study as it is the third most important annual oilseed crop in India, after soybean and rapeseed-mustard. The end-use of kernels is largely guided by the existing market value chains both nationally and internationally. The haulms and pod shells have economic value while the dried haulms are used as fodder for animals, the bi-product pod shells are used in making bricks and for some other industrial uses. The oil cake – obtained after crushing kernels for oil – is used in the feed industry. The market chain of groundnut in India is comprised of intermediaries (individuals and institutions) such as input suppliers, seed dealers, producers, market sellers, rural and urban traders, processors, exporters, and consumers, etc. Due to time and budgetary constraints, the present study was confined only to groundnut kernel and its major products.

2.1 Sample Design

The study was conducted in two major groundnut growing districts (Junagadh and Rajkot) of Gujarat State, India, and data pertaining to the cropping year 2018-19. The sample constitutes about 60 farmers, 20 commission agents, 10 wholesalers, 16 retailers, 60 consumers, and 21 small-scale industries covering 12 villages. Thus, a total of 187 stakeholders of the groundnut market chain were interviewed to obtain information on market standards followed while buying and selling the products (Table 1). All the stakeholders in the market chain were selected randomly (except the Food Processing Industry and HPS [Hand Picked and Selected]) based on their availability during the survey period. The results were arrived at by calculating the arithmetic mean and percentages.

Table 1: Sample design.

Sample/Respondents	Junagadh	Rajkot
Mandals/tehsils*	3	3
Villages	6	6
Farmers	30	30
Commission Agents	10	10
Wholesaler	3	7
Retailers	8	8
Consumers	30	30
Oil millers	3	1
Processors	3	3
Food Processing Industry	0	1
Seed Producers	2	3
Seed Traders	1	1
Exporters	2	2
HPS (Hand Picked and Selected)	0	1
Total	92	97

*Represents group of villages

2.2 Market Standards

Table 2 provides the important grade specifications under AGMARK (Ag' to mean 'agriculture' and 'mark' for a certification mark) by the DMI (Directorate of Marketing and Inspection) under the Agricultural Produce (Grading and Marking) Act, 1937. DMI provides a benchmark for quality, and AGMARK is equivalent to vouching for the authenticity of the products. The product pricing is based on specifications and standards set by the DMI.

Table 2: Grade specification of groundnut pods (unshelled) known commercially as bold, coromandal and peanuts.

Grade designation	Maximum limit of tolerance				
	Foreign matter %	Damaged pods %	Shriveled and Immature pods %	Pods of other varieties %	Shelling % (kernels/pods) minimum
1	2	3	4	5	6
	Bold				
Special	1.0	0.5	3.0	1.0	69
Standard	2.0	1.0	3.5	2.0	66
General	3.0	2.0	5.0	5.0	62
	Coromandal				
Special	1.0	0.5	2.0	1.0	70
Standard	2.0	1.0	3.5	2.0	67
General	3.0	2.0	5.0	5.0	64
	Peanuts				
Special	1.0	0.5	2.0	1.0	72
Standard	2.0	1.0	3.5	2.0	69
General	3.0	2.0	5.0	5.0	66

Source: AGMARKNET: https://agmarknet.gov.in/CommodityProfiles/preface-groundnut.aspx

Note:

- Foreign matter: means dust, dirt, stones, lumps of earth, chaff, stem, straw, or any other impurity.
- Damaged pods: are those pods that are damaged either mechanically or by mould, weevil, or any other insect, or those showing an internal discoloration of kernels materially affecting the quality of the pods.
- Shrivelled and immature pods: are pods that are not properly developed.

3. Results and Discussion

According to Paul (2017)[7], the breeding goals and objectives for demand-led variety design are:

- Trait trade-offs
  – Categorize and rank priority traits
- Categories of traits
  – Plant traits; Tolerance to abiotic and biotic stresses;
  – Consumer/market-preferred traits;
  – Balance of traits, i.e.,
- Basic traits all varieties must have;
- Traits to increase market share; and
- New traits not available in existing cultivars.

The market-preferred traits of groundnut are: shelling percent or count per ounce, moisture content of pod, oil content, and aflatoxin residues (especially for export). The kernels are graded and packed based on what the end user demands. To list the preferred traits of a market it is necessary to understand the market chain, procurement criteria of intermediaries, and preferred industrial traits.

3.1 Groundnut Market Chain

To compete in the market it is important to procure pods/kernels with the specific characteristics required by intermediaries/industries/consumers (Nathan and Kent 2004)[8]. The groundnut is unique on its own with multi-channel procurement means (Figure 1), where a buyer can choose direct procurement (zero distribution in seed industry) to 3-4 level marketing channels (food processing industry). The selection of a channel depends on its margins and the interconnection of product quality assurances and transaction volume commitments[9]. To minimize transaction costs, margins and net profits, the seed companies (both private and public) prefer to procure and sell the pod directly from/to the farmer. Similarly with export units, if the units have processing machinery, the units can procure and export the kernels by shortening the length of the chain. So the entities with processing units play a crucial role in the groundnut value chain.

Farmer's role in the value chain is at the production and post-harvest handling stages. Village traders aggregate the produce from farmers and sell them in nearby APMC (Agricultural Produce and Market Committee). If the prices at mandis are high, majority of farmers prefer to visit mandis and sell their produce there through commission agents. The role of commission agents is to facilitate the auction of the produce at the mandi/APMC. The role of the primary processor in groundnut industry is to de-shell the pod. Generally, long-distance transport is preferred for the shelled groundnut to reduce the cost of transportation. Secondary processing is most widespread in the case of groundnut value chain especially with regard to preparation of secondary processed products of groundnuts, such as roasted/salted nuts, nuts in namkeens, chikki, nut laddu, oil and de-oiled cake. The products find their way to the consumers through a long channel involving 3-4 levels of agencies, distributors, wholesalers and retailers.

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[7] Kimani Paul M. 2017. Principles of demand-led design. In Thebusiness of plant breeding: Market-led approaches to new variety design in Africa (Persley GJ and Anthony VM, eds.). Wallingford, UK; and Boston: CABI.

[8] Smith Nathan B and Wolfe Kent. 2004. Purchasing characteristics of the shelled peanut market. Journal of Agribusiness 22(1):1-16.

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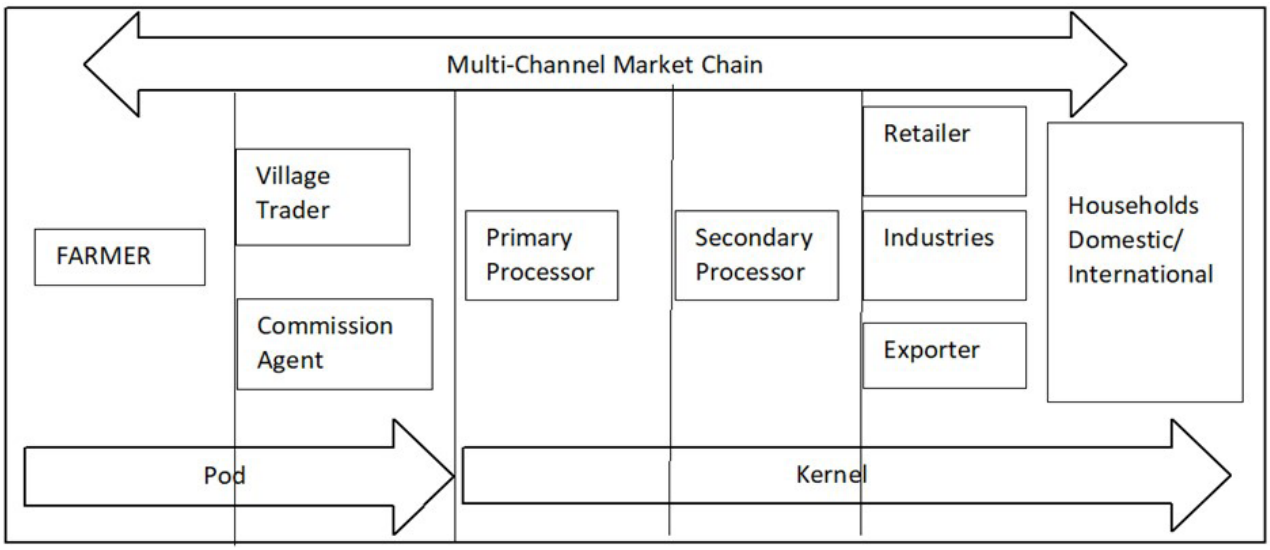

Figure 1. Generic market chain of groundnut.

3.2 Quality Attributes of Procurement

The market-preferred traits in the value chain of groundnut can be broadly classified into two groups based on supply chain stages. The first group procures the pods based on shelling percentage, and the second group processes the pods and sells the produce based on kernels count/ounce. The count/ounce of the kernels was an important parameter considered for both domestic and international marketing by food/confectionery industries while shelling percentage of pods is a parameter at the trading of the pods at market yards. Usually, procurement is carried out by three intermediaries.

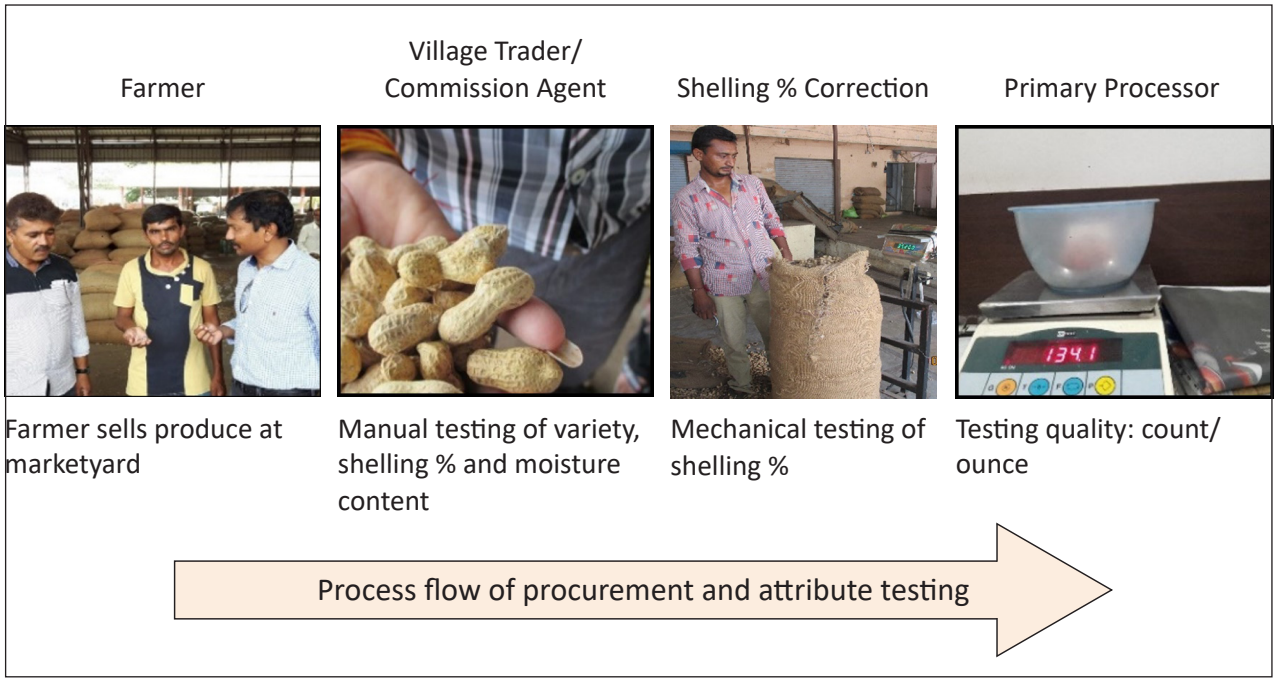

Figure 2. Attribute testing by intermediaries in the value chain.

The flow of pod grading according to desired traits is given below:

A. Commission agents in marketyards usually facilitate the sale of produce by inviting the traders, but before that, they assign the prices to the produce based on the basic and necessary traits, as follows:

1. Identification of variety by name;
2. Shelling % - maximum price for pods with 72.5% shelling rate;
3. Moisture content – 4-7% is the optimal range;
4. Pod infestation – 3-5% of the sample;
5. Mud – 1-3% of the sample.

Identification of variety: The first and most important standard practice followed by the commission agent was the identification of variety. Commission agents are first trained on the identification of varieties as this is a very important criterion to be followed because unlike other produce the groundnut market is segmented, and each industry has its individual varietal preferences and product development standards.

Shelling percentage: Higher shelling percentage implies more kernels and less waste. The higher the shelling percentage, the higher is the outturn of final products, i.e., seed and oil. The most common outturn for a product should be 72.5%, which specified that in 100 g of pods, around 72.5 g is seed weight. The commission agent usually estimates the shelling percentage by taking a sample from a bag (of 20 kg) and examining the pod formation (seed development) manually.

Moisture content: The ideal moisture content of pod should be around 4-7%. Commission agents estimate the moisture by pressing the seeds into their palms.

Pod infestation/damage: Damaged seed – either due to insects or fungi – was not a preferred quality, and the reference range for infestation was 3-5% only.

Foreign material: Extent of foreign material in a sample should only be 1-3% in a 20 kg bag.

B. Wholesaler

A commission agent who agrees to a contract will deliver it to the buyer and buyers can be a wholesaler, seed trader, oil miller, etc. The wholesaler follows the same steps as commission agents but uses a machine for grading the pods so as to improve the accuracy of the shelling rate.

Figure 3 shows a gunny bag with 40 kg capacity weighing around 35.20 kg, whereas the actual requirement is 35 kg per bag with 40 kg pods. Figure 4 shows the moisture content of the pod, which was 3%.

Figure 3. Estimating shelling percentage through weighing.

Figure 4. Estimating moisture percentage .

C. Primary processor

The third and final stage of grading happens at the processing unit. After the evolution and emergence of the food industry and export market, kernel weight became the most important trait for determining the price of the produce. Other parameters for grading are standards as followed by earlier agents.

There are two ways of determining seed weight. The first method of grading measured the weight of the kernel, i.e., 200 pods after decortication should weigh between 145-150 g. This means the shelling percentage should lie between 72.5 – 75%.

From Figures 5-7, it is evident that processing units follow a standard method before finalizing the price for the produce purchased from the wholesaler. For example, in Figure 5, the kernel weight was 144.3 g (72.15 shelling percentage), but the processor made corrections for realizing the actual kernel price by deducting two components, i.e., percentage of damage seeds (0.9%) and additional moisture percentage (0.8%). The required percentage of moisture as per the demand was 4%, but the kernel had excess moisture content of 0.8% in the sample drawn. So the final kernel weight was 142.6 g (71.3% shelling) after corrections.

The second sample (Figure 6) doesn't contain any damaged kernel, but the moisture content was in excess by 0.6%. This change in excess moisture reduced the kernel weight by 0.6 g, i.e., the shelling percentage from 73.65% to 73.20%.

Figure 7 also follows a similar way of pricing the kernel and here the shelling percentage was reduced by 0.9%.

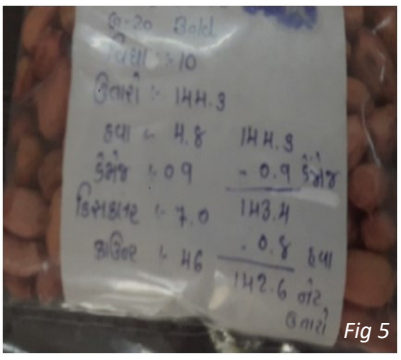
Fig 5


Fig 6


Fig 7

Figures 5-7. Price determination of kernel through count/ounce method.

The second method of determining seed weight is by picking up 28 g of kernels and checking the count. Usually, a count of 60-70 and 70-80 is considered as exportable variety. A count of 80-90 is considered good for the food industry, and anything above 80-90 (due to smaller kernel size) will be used by oil millers.

3.3 Quality Attributes of Industries

Table 3 presents preferred qualities of kernels by industries. Domestic and international market is as per the size of the groundnuts termed as 'count'. Based on the count per ounce, kernels are classified into four broad groups: small (60-80 counts); medium (40-60 counts); large (30-40 counts); and very large kernels (20-30 counts). The most preferred count in domestic market was observed to be between 40-70/55-90. The oil content for oil extraction should be >50% but for rest of the categories, the content must be <50%. The other attributes, such as broken kernels/wastage/admixtures/immature seeds, also play an important role in price determination and any deviation depreciates the value of the kernel. To improve the keeping quality of kernels, the shelf life of the kernel needs to be improved from 3-4 months to higher. One of the leading snack industries prefers G 10 because of high sugar and protein content, less oil and fat, and FFA (Free Fatty Acid) of 0.5%. The FFA content of G 20 is 2.5%.

Table 3: Preferred attributes by industry.

Parameter	Food Processing		Seed	Oil	HPS
	Whole	Split			
Count/Ounce	50/60, 45/55, 40/55	40-55 - 28.5 gms per 100 kernel weight	>60 (bold) >70 (Java)	70/80, 80/90	18/22, 20/24, 22/26
Moisture	7%	8%	8%	4-7 %	6%
Oil %	<50%	<50%		>48-50%	<50%
Broken/ Wastage/ Infested/ Admixture	3%	3%	2%	<1%	1%
Contamination/ Immature seed			4%		
Foreign Material	Absent	Absent			Absent
Aflatoxin (ppb)	5	5	<30		4
Concern	Increase the shelf life from the present 3-4 months		Purity and traceability	Peroxide value 2.5%	

3.4 Consumption Pattern

In the study region, the annual per capita consumption of groundnut kernel and oil was 11.09 kg and 24.09 litres, respectively (Figure 8). According to Virendra Pandit (2013)[10], the average per capita consumption of edible groundnut in the state was 26 kg against 13 kg in other states, accounting for 15 lakh tonnes of consumption demand per annum.

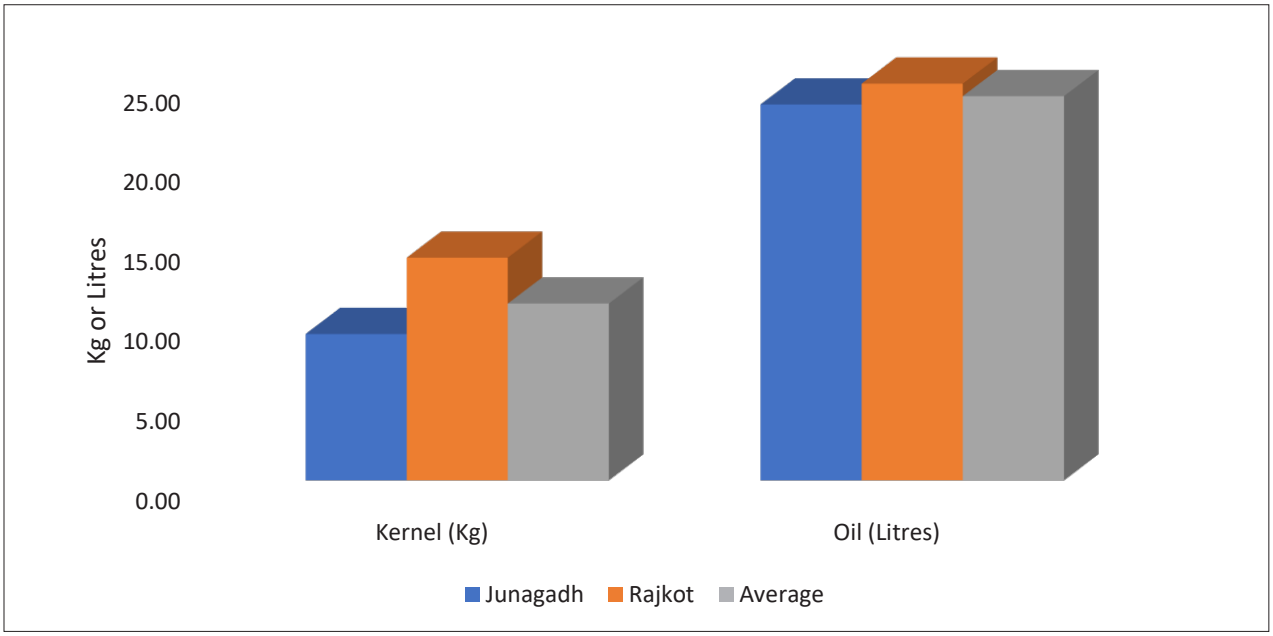

Figure 8. Per capita consumption of kernels and oil.

[10] Pandit Virendra. 2013a. https://www.thehindubusinessline.com/news/variety/gujarat-guzzles-edible- oils/article20617725.ece1

The annual per capita consumption of groundnut kernels by income group and location is presented in Table 4. The results showed that the average per capita consumption of kernels was around 11 kg/annum and the highest consumption was observed in the middle-income group (MIG), followed by low-income group (LIG) residing in semi-urban areas. Lowest levels of consumption were observed in urban areas across all levels of income groups.

Table 4: Per capita consumption of kernels (kg/annum).

Levels	Rural	Semi-Urban	Urban	Average
HIG	17.14	8.67	5.28	6.70
LIG		11.20	8.73	11.64
MIG		19.89	6.00	13.84
Average	17.14	15.00	6.19	11.09

Similarly, the per capita consumption of groundnut oil is given in Table 5. From the table, it was evident that the consumption levels of oil were high in urban areas followed by consumers of semi-urban areas. Lowest consumption levels were observed with consumers of the middle-income group in semi-urban areas (14.28 litres/annum). The average consumption level across all the groups and areas is 26 litres/annum.

Table 5: Per capita consumption of oil (litres/annum).

Levels	Rural	Semi-Urban	Urban	Average
HIG	15.60	39.69	58.91	48.50
LIG		25.71	37.50	25.50
MIG		14.28	38.22	18.80
Average	15.60	20.05	45.05	26.07

According to Mishra and Rathnakumar (2011), the current availability of groundnut in India works out to be 5.5 kg pods/per capita per annum, after saving the seed required for sowing the next crop[11]. With technology-led enhanced productivity, this availability is likely to be doubled by 2020. Considerable scope also exists to improve the available production technologies by developing high-input responsive varieties and complementary cultural practices for efficient management of available irrigation-water and other inputs. Groundnut offers excellent opportunities for value addition and utilization of byproducts viz., groundnut shell and the cakes remaining after oil extraction.

According to Krishna Kothapally (2016)[12], the business head of Sunsolite, the per capita demand for edible oil has risen from 14.4 kg in 2013-14 to 15 kg in 2014-15 and about 15.6 kg in 2015-16. However, he also says there is a shift in consumer preferences from groundnut oil to lighter oils. “Groundnut oil, known for its aroma, is seen as a heavier oil compared with other edible oils. But once it is refined, groundnut oil loses its aroma and is like any other refined oil,” he said.

[11] Misra JB and Rathnakumar AL. 2011. Vision 2030. Junagadh: Directorate of Groundnut Research.
[12] http://www.commodityindia.com/templates/more_news.aspx?gid=Oilseed&fn=DtGround020816

3.5 Market Share

The proportion of agricultural production that is marketed by the wholesaler is as indicated in Figure 9. The figure shows that the bulk of groundnut pods (45%) goes to oil mills for various utilities and not necessarily for groundnut oil production. The Solvent Extractors Association of India reported that of late, only 49% of the groundnut produced is available for oil crushing[13]. The edible oil consumption in Gujarat is around 8-9 lakh tonnes/annum, with groundnut now having a share of around 15-18%[14]. However, the all-India share of groundnut oil within total edible oil consumption was found to have declined sharply from 13% (2001-02) to 0.1% in the year 2015-16[15] indicating that major percentage of groundnut was used for non-oil consumption. In the 1980s, about 80% of the produce was crushed for oil expulsion, about 6% was used for direct consumption (including 1% for export), and the remaining 14% was used for seed. In the last two decades, a major shift towards direct consumption was observed, and even more recently this has gone up to about 35% and only 50% of the total produce is crushed for oil expulsion[16].

The second major share was occupied by the Exports Segment (28%). As per the Groundnut Price Forecast document, the exported volume of groundnut from Gujarat was 23% of the total production (35 lakh tonnes)[17]. This value was lower than from the study region probably due to surveying the high groundnut concentration areas.

The third important segment was the Food Processing industry – accounting for 15% of the share in market. An important processed product in the category is Hand-picked and Selected Groundnuts (HPSG). The domestic consumption of groundnuts has also seen an increase of ~4% from 2015 to 2016. The projected domestic demand of groundnut would be about 25 million tonnes in 2050[18]. Considering the current national average productivity of 1700 kg/ha, a growth rate of about 4-5% in productivity is necessitated to meet the demand, given the existing cultivable area under groundnut[19].

Another important vertical in the food processing segment is peanut butter (not covered in this study) and many companies established their plants in Gujarat to make peanut butter. As per the industry estimates, 10,000 to 12,000 tonnes of peanut butter is produced annually in Gujarat and over 90% is exported across the globe[20].

The Gujarat government has procured 647,737 tonnes of groundnut so far and spent over Rs 2,882.43 crore[21] during the year 2016-17. This accounts for 18% of the total production in Gujarat. The study has projected a share of 12% by seed industry which is less than what was estimated. This deviation can be due to procurement from other sources and regions which was not accounted for in the formal surveys.

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[13] Govindaraj G and Jain Vimal K. 2011. Economics of non-oil value chains in peanut: A case of peanut-candy and salted-peanut small-scale units in India. Journal of Agricultural Sciences 56(1):37-54.

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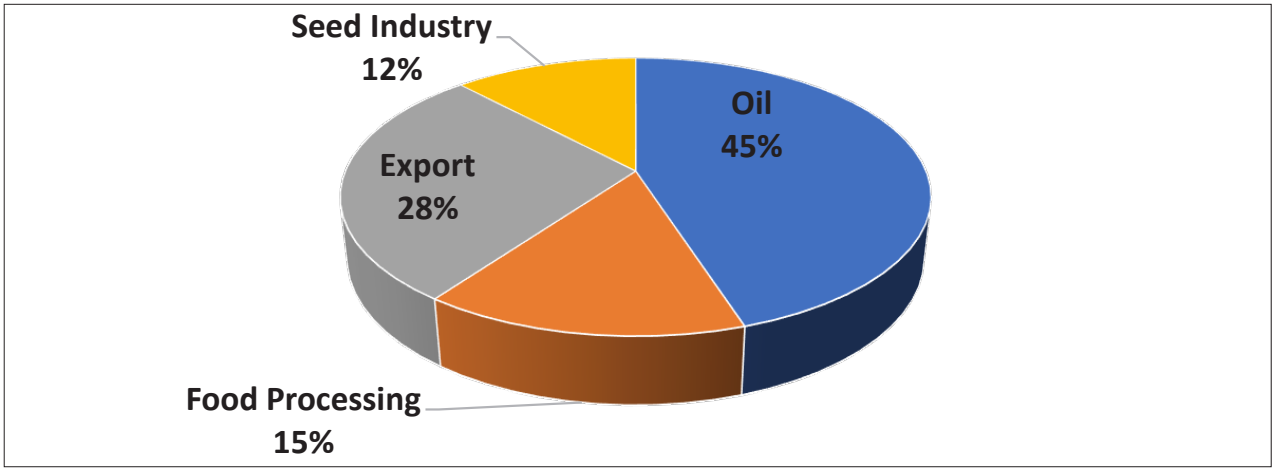

Figure 9. Market share of groundnut by segment.

3.6 Feedback from stakeholders[22] on high oleic groundnut cultivars (2019)

Groundnut has a strong value chain and is being used as food, table purpose and making diverse confectionery products. The industry has a set of requirements/criterion for selecting the produce for processing and value addition. Kernel size is one of the industry criterion for selecting the produce for different purposes. In earlier days, market preferences were limited. But now confectionery industries prefer 38-42, 40-50 and 50-60 counts per ounce for salted/roasted/fried peanuts used for table purposes, as well as for making other confections. Kernel shape and testa colour are other important traits for industries; light tan and rose testa is preferred over dark tan. As a final point, end use, kernel colour and regional preferences, etc., determine both market acceptability and prices. However, large seeded type will fetch premium prices when compared with regular sized kernels.

Elongated kernels (Chinese flat peanuts) are preferred over round seed shape for confectionery industry. Varieties with low to normal oil content (~45-48%) is preferred by confectionery industries and for making peanut butter, whereas varieties with higher oil content is preferred by oil millers. Groundnut price in the markets is decided based on oil content. Farmers usually get premium prices for their produce based on percentage of oil recovery. There are some markets, for example Germany, where small seeded groundnuts with red coloured testa is preferred. Similarly, the kernels from Gujarat are tasty and low in aflatoxin content when compared with groundnut from other southern states of India.

Industries are keen to adopt high oleic groundnuts as they offer several health benefits to consumers – such as enhanced flavour and extended shelf life among others. There is huge demand for high oleic groundnuts in European countries that are supplied by Argentina, USA and Brazil. Argentina could export more to international markets because of their lower cost of production when compared with other countries. The release of high oleic groundnut varieties would also increase India's ability to export to European countries. Currently, industries in India are ready to pay a premium of Rs 500/ quintal for high oleic groundnut grown in India. However, future research should focus more on high oleic varieties with suitable kernel size distribution and kernel counts.

[22] Summary of panel discussion organized with stakeholders at the GNG-Asia meeting held at ICRISAT on 26-27 Sept 2019

Summary and Conclusions

India is a world leader in groundnut – holding 16.27% of the global cropped area – and positioned second in world production (FAOSTAT 2022). The gross production value of groundnuts in India is USD 4.27 billion (FAOSTAT 2014) outstanding among all other oilseed crops. Among Indian states, Gujarat stands first in both area and production (after bifurcation of Andhra Pradesh). However, pod yield is highest in Tamilnadu, followed by Rajasthan and Gujarat. Groundnut is mainly grown for kernels, edible oil, livestock meal, and vegetable residue, etc. Groundnut produced in India caters to different sectors that can be categorized into at least five major sectors: 1) oil millers – for extraction of high-quality groundnut oil; 2) Direct consumption as food; 3) food processors – for developing varied food products such as peanut butter, chocolates, cookies, snacks and savories; 4) export – for exporting to international markets to get high returns; and 5) feed industry – for providing feed to poultry and livestock. With all parts of the plant being used, but primarily for human consumption, it necessitates better understanding of the groundnut value chain.

The study revealed that a complex network exists between the producers, commission agents, seed processors, seed traders, and consumers. The primary selling hub for groundnuts in Gujarat is the Agricultural Produce Market Committee (APMC) through commission agents. Farmers come to APMC, and the price for a 20 kg gunny bag is decided based on the variety, shelling outturn, 100 seed weight, moisture content, and insect damage. Initial grading is carried out by commission agents at APMC and produce with 72.5% shelling percent and 4-7% pod moisture content, pod infestation of 3-5% and mud content under 1-3% will go for bidding at the highest price. Then it is reconfirmed by a bidder (wholesaler/buyer) through mechanical grading (using machines). The standardization unit of groundnut after shelling is kernel weight. The standard unit of kernel after decortication is 200 g pods which should weigh between 145-150 g, i.e., 72.5-75.0% shelling percentage. This is apart from the other parameters mentioned above. For oil extraction, the percentage of oil content should be >50% and peroxide value should be around 2.5%; for cake purpose protein content should be 50%, sand silica content of 2.5% with 12% fiber. Only small, shriveled and damaged seeds are processed for oil extraction as it is not economical if bigger kernels are used. Preferred count was 50/60 for the domestic food industry and for export it varies based on country and industry.

The market share of various industries shows that 45% groundnut pods was consumed by oil mills for different product development and not necessarily for groundnut oil production, secondly by the export market (28%), food processing industry accounting for 15% of the share in market, and seed industry share was around 12%. With the projected domestic demand for groundnut around 25 million tons by 2050 and with current national average productivity (~1700 kg/ha), a growth rate of about 4-5% in productivity is required to meet the burgeoning demand, given the existing cultivable area under groundnut. Stakeholder feedback indicates interest for high oleic varieties from confectionary industries. Since the release of first high oleic groundnut varieties in India, both the confectionary and oil industries have shown immense interest to use them in their products.

To conclude, shelling percentage and moisture content play a significant role in both trade and consumption. Hence crop improvement scientists should focus on improving shelling percentage if the income of the groundnut farmer is to be maximised.

ICRISAT
INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS

About

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a pioneering, international non-profit scientific research for development organization, specializing in improving dryland farming and agri-food systems. The Institute was established as an international organization in 1972, by a Memorandum of Agreement between the Consultative Group on International Agricultural Research and the Government of India. ICRISAT works with global partners to develop innovative science-backed solutions to overcoming hunger, malnutrition, poverty, and environmental degradation on behalf of the 2.1 billion people who reside in the drylands of Asia, sub-Saharan Africa, and beyond.

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