

## Indian cashew food

Parashram Jakappa Patil\*

The Institute for Natural Resources, University of Pune, Kolhapur, Maharashtra, India

### Abstract

India has suitable geographical conditions for cashew cultivations hence it is one of the largest cashew producing country in the world. Cashew production mainly found in India in an around western ghats. Cashews have a lower fat content than most other nuts, approximately 82% of their fat is unsaturated fatty acids, plus about 66% of this unsaturated fatty acid content are heart-healthy monounsaturated fats, similar to those found in olive oil. Since it is good for health cashews is a good idea, especially for persons with diabetes. Therefore, developed countries cashew is important food in their consumption bracket. Hence India's contribution in world's cashew food supply is very vital and trustworthy. The present research work will deal with to 1. To study India's cashew processing and its mechanism, 2. To understand importance of cashew as food. 3. To make glance on India's contribution on world cashew food supply. It is case study of India in context of supply cashew food to entire world.

### Introduction

India has certain important horticulture crops which is contributes in Indian agriculture economy. Cashew is such versatile crop which is mainly belong to rural community. India has suitable geographical conditions for cashew cultivations hence it is one of the largest cashew producing country in the world. Cashew production mainly found in India in an around western ghats. Numerous agriculture and natural resources having by Western Ghats in that cashew is important agri resources. It is working like white gold for local people. It has made systematic effort for development of cashew in India. Separate infrastructure for cashew research and extension has been developed due to which cashew production grown in India tremendously. Indian Cashew is known world-wide for its excellent quality. India being a leader in cashew production is also world's largest producer, processor and exporter of cashew kernels [1-10].

### Statement of the problem

India is major supplier of cashew food in the entire world. It is this country which providing cashew food to entire world form centuries. Hence it important to understand how India fulfill demand of cashew food of entire world. Assessment of India's cashew processing is vital in order to understand cashew as food, it is because it's going through various cashew processing stages. It effects on quality of food. Therefore, making glance on India's cashew processing and its dynamics would bring more focus on cashew as food.

### Objectives of the study

1. To study India's cashew processing and its mechanism.
2. To understand importance of cashew as food.
3. To make glance on India's contribution on world cashew food supply.

### Hypothesis

1. Cashew food is significantly impact on human health.
2. Indian is significantly contributing in world cashew food.

### India's export of cashew kernel

Cashew-nut industry has the big export potential which has increasing the prospects of the industry. The following table clears the whole picture of the Indian cashew kernel export.

India is the second largest exporter of cashew kernels in the world. Table 1 shows the growth of cashew kernel export. The cumulative growth rate of cashew-nut production in respect of quantity of export and value of export is (238.55%) and (1128.48%) respectively. It indicates that India has been making progress in the cashew export sector over a period of time. India has a potential to become a world leader of cashew export. The export of cashew kernels gives valuable foreign exchange to the Government of India. The growth of cashew kernel exports seems satisfactory.

### India's export of cashew nut shell liquid

The industry has many business dimensions. The export of cashew nut shell liquid is one of the important dimensions. The following given table focuses on the particular issue.

Cashew-Nut Shell Liquid Oil (CNSL) is an important by-product of cashew. It has huge export potential due to its distinct characteristics. Table 2 reveals the growth of CNSL export. The cumulative growth rate of cashew-nut production in respect of quantity of export and value of export is (193%), (241%) respectively. It shows export of CNSL has been making progress an over a period of time. Indian earns valuable foreign exchange by making export of CNSL. The growth of export seems good and is increasing continuously.

**Correspondence to:** Parashram Jakappa Patil, Social Scientist, Post Doc Fellow, Chairman, The Institute for Natural Resources, Kolhapur, Maharashtra, India, Tel: 919975360901; E-mail: patilparashram9@gmail.com

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Table 1. Export of Cashew Kernel from India.

Year	Export Quantity (In M.T.)	Export Value (In Rupees in Lukas)	Export quantity Cumulative Growth (In %)	Export Value Cumulative Growth (In %)
1990-91	49874	44224		
1991-92	47738	66909	95.71	151.29
1992-93	53436	74549	107.14	168.57
1993-94	69884	104602	140.12	236.52
1994-95	77000	124602	154.38	281.75
1995-96	70334	124050	141.02	280.5
1996-97	68663	128550	137.67	290.67
1997-98	76593	139610	153.57	315.68
1998-99	75026	160990	150.43	364.03
1999-00	92461	245145	185.38	554.32
2000-01	89155	204975	178.76	463.49
2001-02	97550	177680	195.59	401.77
2002-03	104137	193302	208.8	437.09
2003-04	100828	180442	202.16	408.01
2004-05	126667	270924	253.97	612.61
2005-06	114143	251486	228.86	568.66
2006-07	118540	245515	237.67	555.16
2007-08	114340	228890	229.25	517.56
2008-09	109555	299844	219.66	678.01
2009-10	117991	280160	236.57	633.5
2010-11	105775	281939	212.08	637.52
2011-12	131760	439068	264.14	992.82
2012-13	104015	406721	208.59	919.68
2013-14	114791	505873	230.2	1143.88
2014-15	118952	543285	238.55	1128.48

Source: (Author Calculations).

Table 2. Export of Cashew-nut Shell Liquid from India.

Year	Export Quantity (In M.T.)	Export Value (In Rupees in Lukas)	Export quantity Cumulative Growth (In %)	Export Value Cumulative Growth (In %)
1990-91	5658	556		
1991-92	4542	402	80	72
1992-93	4258	381	85	78
1993-94	3625	290	74	23
1994-95	3807	244	77	31
1995-96	760	145	24	14
1996-97	1735	277	41	37
1997-98	4446	717	88	116
1998-99	1572	326	38	186
1999-00	764	184	24	161
2000-01	2246	3894	40	828
2001-02	1814	419	33	203
2002-03	7215	925	128	294
2003-04	6926	703	123	255
2004-05	7474	791	132	270
2005-06	6405	709	114	257
2006-07	5589	920	100	294
2007-08	7813	1197	139	343
2008-09	9099	26.06	160	200
2009-10	11227	27.62	198	247
2010-11	12051	33.77	212	265
2011-12	13575	59.46	239	298
2012-13	9192	29.84	162	202
2013-14	9489	38.61	167	208
2014-15	10938	55.81	193	241

Source: Author Calculations

## India's cashew export market

India's cashew export is very large. It spread almost throughout the world. This spread indicates depth of India's cashew export market that makes the Indian cashew-nut industry a leader of world cashew economy.

Table 3 explain the depth of India's cashew export market & how its spread across the world. It also reveals the export potential and availability of export market for India cashew-nut industry which needs to explore. It also shows that American and European countries are largely importing cashew kernel from India. It means India has strong presence in their cashew market.

## India's cashew-nut shell liquid oil export market

Along with quality cashew kernel Indian cashew-nut industry is producing quality cashew-nut shell liquid oil which also exportable. Indian cashew-nut industry has big market for CNSL.

Table 4 explains the India's market for CNSL, India is also having very good market for CNSL which enhance the prospects of Indian cashew-nut industry as well as India's cashew export sector. CNSL oil is use in industries hence there is good demand from industrially developed countries. USA & China are the top most import of Indian cashew-nut shell liquid oil [11].

**Table 3.** Export of Cashew Kernels from India.

Countries	Quantity (M.T.)	Value (Rs. Cores)
U.S.A	35236	911.31
U.A.E	12295	393.31
Netherlands	11178	289.02
Japan	5944	159.16
Saudi Arabia	3386	107.53
U.K.	2798	71.76
France	3623	90.12
Spain	2634	69.14
Germany	1739	41.51
Belgium	2986	72.47
Singapore	1692	41.31
Italy	1194	29.11
Greece	1311	35.36
Thailand	733	21.57
Australia	1359	32.70
Russia	484	13.53
Canada	678	16.53
Kuwait	1001	31.19
Egypt	1184	37.72
Algeria	221	6.33
Turkey	1346	36.56
Korea Rep.	717	20.25
Jordan	1093	31.07
Norway	727	19.09
Syria Arab Rep	850	25.87
Honk Kong	530	15.14
Others	8819	17.23
<b>Total</b>	<b>105755</b>	<b>220.71</b>

Source: CPCI

**Table 4.** Export of Cashew-Nut Shell Liquid Oil from India during.

Countries	Quantity (M.T.)	Value (Rs. Cores)
U.S.A	5374	12.05
China	3142	8.39
Korea Rep.	1697	5.83
Japan	712	2.16
Taiwan	122	0.80
Slovenia	267	1.13
Indonesia	160	0.46
U.K.	0	0.00
Singapore	153	0.99
Iran	0	0.00
Others	424	1.90
<b>Total</b>	<b>12051</b>	<b>33.77</b>

Source: CPCI

## Importance of cashew food

Cashew is very significant having tremendous health benefits hence it is being loved across the world. Following are the some of the benefits of cashew food.

- **Prevents Cancer:** It is most important of cashew food that it prevents cancer. Proanthocyanidins are a class of flavonols which fight against tumor cells by stopping them to divide further. These proanthocyanidins and high copper content in cashew nuts help fight against cancerous cells and keeps you away from colon cancer.
- **Healthy Heart:** Cashew is helpful for making healthy heart. Cashews contain low fat content when compared to other nuts and that too in the oleic acid form which is very healthy for heart. They are cholesterol free and the antioxidants present keeps you away from heart diseases.
- **Blood Pressure:** Cashew nuts lower blood pressure with the help of magnesium present in them.
- **Helps Hair:** Copper is the mineral which helps hair get that color.
- **Healthy Bones:** Like calcium, magnesium is also important for bone health which is the main content in cashew nuts.
- **Healthy Nerves:** Magnesium is stored on the bones surface which prevents calcium from entering the nerve cells and thus keeps the blood vessels and muscles relaxed. Insufficient amount of magnesium can lead calcium to enter the blood vessels leading them to contract. It also leads to high blood pressure, migraine headache etc.
- **Prevents Gallstones:** Daily intake of cashewnut can reduce the risk of developing gallstones up to 25%.
- **Helps in Weight Loss:** Even though cashew nuts are considered as fats, it contains good cholesterol. So, contrary to popular belief, those who eat cashews at least twice a week gain less weight when compared to those who eat less.
- **Anti-oxidants:** Selenium, copper, magnesium etc. act as co-factors for many enzymes.
- **Helps Digestion:** Cashew nuts help in growth and development, nucleic acid synthesis and digestion
- **High on Vitamins:** Cashew nuts are rich in vitamins like riboflavin, pantothenic acid, thiamin, niacin etc. These vitamins keep you safe from sideroblastic anemia, pellagra, etc.

- **Healthy Gums and Teeth:** As mentioned before, the magnesium content present in cashew nuts is very good for bones. So, it gives healthy teeth as well as strong gums to hold them [12-14].

- **Pleasant sleep:** After menopause, these cashew nuts can give you relaxed and pleasant sleep during nights.

- **Free Radicals:** Cashew nuts help our body to utilize iron properly and eliminate free radicals which cause health problems.

- **Macular Degeneration:** Cashew nuts can filter Sun's UV rays and protect us from macular degeneration.

Thus, cashew consumption is very vital for human health, it is providing numerous health benefits. It is one of the rear food which content so much of positive input for health. Hence India is providing important role in world health protection by providing cashew food to entire world.

### Cashew processing methodology

Cashew processing is the systematic activity involving many processes. Over a period, there has been improved in cashew processing machinery and technology. Initially cashew processing was manual because of which there was big loss of cashew kernel. But with commercialization of cashew-nut industry there are many innovations in cashew processing machinery which produce quality cashew kernel. This article focused on cashew processing and packaging machinery. The following are the steps of cashew processing machinery and its technology are given in detailed.

**Cleaning, sizing and conditioning:** The first cashew processing operation is the removal of foreign matter and dirt from the nuts. The nuts are collected from the ground after falling from the trees. Apples are removed along with other foreign matter. At the simplest level, the nuts are sieved by hand using a three-quarter inch (20 mm) mesh sieve to remove dust and dirt (ITDG, 2000). The cleaned nuts are then conditioned in preparations for removal of shell. Conditioning increases the brittleness of the shell and thereby facilitates its removal.

**Soaking:** The next step is to soak the nuts in water to avoid scorching them during the roasting operations. This can be done by placing the nuts in a (40-45) gallon drum or vat and filling it with water until all the nuts are covered. After being left to stand for about ten minutes, the water should then be drained off via a plug near the base of the drum. The should then be left for periods of not less than four hours to allow the water left on the surface on the nuts to be absorbed. The process of covering the nuts with water, darning and standing should be repeated with the same nuts about three times until a moisture content of 9% is reached. Whether the production output runs from (2-10) tons per day, a simple cleanings and conditioning arrangement can be used. Two people open the sacks of harvested nuts on a stand and clean the raw storage until the soaking process begins. Two vats are useful because one can be emptied while the other is being filled (ITDG, 2010).

**Roasting of cashew:** There are different methods which are using for cashew roasting in India such as Sun Roasting, Open Pan Roasting, Drum Roasting and Oil Bath Roasting and stem roasting. At present in India stem roasting is applied hence we would focus on that only in detailed. The steam process was an innovation of 1980s. This process involves roasting by direct application of steam to dry nuts. Raw nuts are steam cooked at about 120-140 lbs/sq inch pressure, then nuts are allowed to cool for 24 hours and taken for shelling. Shell oil can be extracted in later stages by crushing. Nuts are shelled by hand and leg operated shelling machines (DCCD, 2010) [15-19].

**Cashew shelling:** Cashew-nuts after roasting and cooling are to be shelled to remove kernels. It is a careful process it has to be taken sufficient care while making cashew shelling. The hands have to be protected from cashew-nut shell liquid oil which is highly corrosive, hand gloves should be used for cutting work. The commercial cashew processing units use foot operated shell cutters (Mechanical Device) for shelling. This device consists of a pair of blades (knives) shaped in counter of half a unit, which could be operated by foot. The blades cut through the shell all around the nut, leaving the kernel untouched. After shelling the kernels and shell pieces are separated manually. The nuts have to be grouped into various sizes matching of pair of blades of appropriate size (DCCD, 2010). Now day's automatic cashew cutting machine used by processors which replace manual cashew cutting work. It also reduces workforce [20].

**Drying:** After the shelling is over the next step is to dry cashew kernel. The kernels after shelling will have a moisture content of more than 6%. Drying of kernels is necessary to prevent fungus attack during subsequent storage and to facilitate peeling of testa. The kernels are to be dried to a moisture content of about 4-5%. This is done by drying the chambers in hot chambers at 70-80°C in perforated trays for about 6-8 hours. Uniform drying could be achieved with a cross flow drier using forced hot air circulation through the kernel layers. In order to uniform drying, the position of trays has to be changed frequently, as scorching may occur at hotter places. Excess drying of kernels becomes very brittle resulting in higher breakages. After drying the kernels are kept in the moist chamber for 24 hours which facilitates easy removal of testa (peeling) and reduced broken kernels (DCCD, 2010).

**Peeling:** After drying the next step is of cashew peeling. In this stage testa is loosely attached to cashew kernel, although few kernels may have already lost testa during prior operations. Manual peeling is generally performed by gently rubbing with fingers. Still those parts attached to kernels are removed with use of a bamboo knife. Approximately 10-12 kg kernels could be peeled by one person in a day [21].

**Grading:** Here cashew kernels are graded as per their color, taste, weight, and size, to increase their commercial value. Commercial value of cashew kernel is depending on individual grade.

**Packing:** The normal packing for export is in air-tight tins of 25 lbs in weight. The packing needs to be impermeable as cashew kernels are subject to rancidity and go stale very quickly. The tin will be familiar to most tropical countries as it is a replica of the four-gallon kerosene or paraffin oil tin. If possible the tins are made locally as movement of empty tins overseas is expensive. Alternatively, it might be arranged to purchase components and finish the manufacturing locally. This may be done by arrangement with tin manufacturers. The output of a tin manufacturing line is usually too large for one consumer but some cashew-nut processors have in fact installed their own tin making plant and supply other processors [21].

After filling and weighing, the cap should be soldered on in preparation for the 'vita pack' process. This consists of removing all air from the tin and substituting this with carbon dioxide (CO<sub>2</sub>). The advantages of packing cashew kernels in carbon dioxide are twofold. Firstly, carbon dioxide is an inert gas and will not support life. Any infestation that may have been present is therefore arrested. Secondly, carbon dioxide is soluble in cashew oil and goes into solution as soon as the seals are made. In a short space of time, it can be seen that a decrease in pressure takes place as the carbon dioxide goes into solution and the sides, top and bottom are drawn inwards. Thus, the kernels are held tight in the tin, preventing movement and breakages

during transport. Carbon dioxide, being a heavy gas causes the upward displacement of air and will remain in the tins after the filling process. Some large-scale machines will operate on six tins at a time, creating a vacuum in each and then filling with carbon dioxide. Some processors do not have vacuum pumps and displace the air in the tin by feeding in carbon dioxide through small hole in the bottom of a side of the tin. The carbon dioxide valve is turned off when all the air has been replaced. The holes in the tin are then sealed, with the hole at the bottom of the side of the tin being done first, and the one on the top last [21]. Thus, cashew-nut go in different process and after that it's become eatable product. Over period of time due to advancement in processing technology, process has become simplified and producing more. Most of the processing innovations had been took place in Indian cashew factory. At present all cashew processing machinery has been developed India only. Innovation in cashew processing machinery over a period of time is one of the reason that Indian is global leader in world cashew economy [22,23].

## Conclusion

Indian is pioneer in cashew business which is very providing cashew to entire world. Cashew as food is very important especially in American and European countries. It has rich proteins and vitamins hence it more popular. Since cashew processing is going various stages one has to be careful about it otherwise its effects on its quality. Being largest cashew producing, processing and exporting country in the world is directly contributing in food security of the world. Cashews have a lower fat content than most other nuts, approximately 82% of their fat is unsaturated fatty acids, plus about 66% of this unsaturated fatty acid content are heart-healthy monounsaturated fats, similar to those found in olive oil. Since it is good for health cashews is a good idea, especially for persons with diabetes. Therefore, developed countries cashew is important food in their consumption bracket. Hence India's contribution in world's cashew food supply is very vital and trustworthy. Cashew food is providing numerous benefits to human health such as prevention of cancer, healthy heart, healthy bones, blood pressure, Prevents Gallstones, helps hairs, free Radicals, sound sleep, Healthy Gums and Teeth, vitamins, proteins, weight loose, Anti-oxidants, digestion, healthy nerve, sleep etc. Hence India's contribution in human health by providing cashew to entire world is significant.

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