

Cashew processing

Harvesting

The cashew tree commences fruiting in the third or fourth year, attains the full bearing age by the tenth year and lives for 40 to 50 years. Flowering commences in November and extends upto February. The peak months of harvest are March-April and the remaining crop comes to harvest in February and May. The ripened will fall down and nuts from fallen fruits have to be collected.

Yield

The yield starting from 1 kg in 3rd-4th year, yield goes on increasing as the canopy develops and one can expect more than 10 kg of nuts in 8 to 10 years old plant depending on management.

Drying

The nuts collected should be dried immediately under sun by spreading in a thin layer. If the surface is of cement concrete, drying for two full days is sufficient. If the surface is of mud, drying for 3 to 4 days is necessary. While drying, the nuts should be raked quite often. Nuts should not be dried for more than four days since they become brittle and break while processing, causing damage to the kernels.

Cashew processing

Processing of cashew is defined as the recovery of edible meat portion the kernel from raw nuts, by manual or mechanical means. In India, the processing is by manual means. It consists of

1. Roasting
2. Shelling
3. Peeling
4. Grading
5. Packing

Moisture Conditioning or Humidifying:

A slight under roasting or over roasting adversely affects the quality of the kernels. This is achieved by a moisture step preceding the roasting. The raw nuts are sprinkled with water and allowed to remain in moist condition for about 24-48 hours. This step is known as conditioning. The optimum moisture level at the end of roasting is reported to be 15-20%. Two important points to be taken care of during conditioning are;

- The water should not seep through the brown testa.
- The water should be free from iron contaminations.

Iron contamination in the water can interact with polyphenolic materials of testa and the resultant bluish black complex may give patches on white kernel.

1. Roasting

Roasting is designed to make shell brittle.

a. Open Pan Roasting

The earliest process was the pan roasting wherein the nuts are heated on a metal pan over an open fire. Due to the heat and slight charring the shells become brittle. The pan roasting is not followed in organized sectors of industries. The two important methods of processing now adopted are; a. Drum roasting and b. Oil bath roasting

b. Drum roasting

The nuts are fed into a rotating hot drum, which ignites the shell portion of the nut. The drum maintains its temperature because of the oil oozing out of the nuts. The drum is kept in rotation by hand for about 2-4 minutes. The roasted nuts which are still burning are covered with wood ash to absorb the oil on the surface. The rate of shelling and the outturn of

whole kernels are very high in this method. However, the main disadvantage is the loss of CSNL which has a very high export potential. In addition there will be considerable heat and acrid fumes in the vicinity of this operation.

c. Oil bath roasting

In this method, the nuts are held in wire trays and are passed through a bath of cashew shell oil maintained at a temperature of 200-202oC for a period of three minutes whereby the shell oil is received from the shells to maximum possible extent. The vessel is embedded in brick work and heated by a furnace which use spent shell as fuel. During roasting, the shell gets heated and cell wall gets separated releasing oil into bath. As the level rises the oil is recovered by continuous overflow arrangement. The roasted nuts are then converted into a centrifuge. The residual oil adhering to the surface of nuts is removed by centrifuging. The roasted nuts are mixed with wood ash and sent for shelling.

In Panruti (Tamilnadu) the conventional roasting is completely avoided. The raw nuts are exposed to the intense sun that is prevalent in that region. The well dried nuts are hand shelled. Here also the CSNL is completely recovered.

2. Shelling

After roasting, shelling is done by labour. Each nut is placed edgewise and cracked open with a light wooden mallet and the kernel extracted with or without wire prong. Care has to be taken that the inner kernel is intact and not broken into

bits. After kernels are removed from the shells they have to be dried to reduce the moisture to loosen the adhering testa.

3. Peeling

Peeling is the removal of testa from the kernels. This is done with help of safety pin or small hand knife. Peeling is made easier when the kernels are subjected to a heat treatment for about 4 hrs in a drying chamber.

Sweating

After peeling, the kernels are spread out indoors on cement flooring so that they may absorb some moisture and become less brittle. This prevents the tendency to break easily during grading.

4. Grading

The next stage in the processing is the grading of kernels on the basis of specifications for exportable grades. There are 25 exportable grades of cashew kernels. The kernels are stored into wholes, splits and Broken primarily on the basis of visual characteristics. The wholes are again size-graded on the basis of the number of kernels per 1lb. The entire grading operation is done manually. However, for size-grading mechanical operation is also practiced.

Specification for cashew kernels

Grade designation	Number of kernels per lb	Grade designation	Number of kernels per lb
W 180	375 to 395	W 320	660 to 705
W 210	440 to 465	W 400	770 to 880
W 240	485 to 530	W 450	880 to 990
W 280	575 to 620	W 500	990 to 1100

General Characteristics

Cashew kernels shall have been obtained through shelling and peeling cashew nuts, shall have the characteristic shape, shall be white or pale ivory or light ash in colour, reasonably dry, and free from insect damage, damaged kernels and black or brown spots. They shall be completely free from rancid kernels. The kernels shall be completely free from testa.

Grade designations and their trade names:

Grade designation	Trade names		Trade names
SW	Scorched wholes	SB	Scorched butts
SSW or SW IA	Scorched wholes seconds or scorched wholes IA	SS	Scorched splits
DW	Desert wholes	SP	Scorched pieces
B	Butts	SSP	Scorched small pieces
S	Splits	SPS	Scorched pieces second
LWP	Large white pieces	DP	Desert pieces
SWP	Small white pieces	DSP	Desert small pieces
BB	Baby bits	DB	Desert butts
		DS	Desert splits

5. Packing

Final operation is packing in 10 kg capacity tins, which are subsequently evacuated and filled with carbon dioxide. In some parts to overcome the possible over-drying a re-humidification step is introduced before packing. The practice of filling with an inert gas is mainly to combat infestation during transit. It may be pointed out that with high quality nut, free from infestation, storing with or without carbon dioxide makes very little difference particularly with reference to rancidity. The importance of inert gas appears to be more for circumventing a possible insect attack from an occasional insect egg entering the tin while packing. Nitrogen can also do the same function. However,



carbon dioxide being a heavier gas is more convenient for handling. Contention that absorption of carbon dioxide makes the kernel tastier does not have much truth. In any case the processed kernels are rarely consumed without a subsequent heat processing in the form of roasting frying and/or baking.