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MFG. CASHEW PROCESSING MACHINERY

Quality of cashew nuts

“Out-turn” and “Total defective nuts”

What you need to know about it



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(Here information about the costs for the “out-turn kit” could be provided and where to get it)



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Quality of cashew nuts: Out-turn and what you need to know about it

It is important to remember that the excellence and thoroughness of post harvest handling affects the quality of the product, which in turn affects the country's reputation for those products. Product quality influences the demand for those products on the world market, which in turn positively affects the price based on the quality of raw cashew nuts.

What is quality and how we define it?

- Is it big nuts?
- Good looking nuts?
- Shiny surface nuts?
- or a mix of all parameters?



Nut count could be used if you have no other means of evaluating your raw nuts, but this does not tell you much about the quality of the kernel inside. It is the characteristics of the kernel which matters for the processor and the consumer.

Processors use **Out-turn** as a common platform to analyze the quality of cashew nuts accepted by all market players worldwide.



What does Out-turn mean?	In general Out-turn means the amount of usable kernels after de-shelling the nut. It is expressed in lbs quality, which just means the weight of useful kernels weighed in pounds in one bag of 80 kg of raw nuts
I have heard that und seen numbers, what do they stand for?	48 lbs quality and above is standard grade buyers normally prefer 48 – 54 lbs quality Less than 43 lbs quality is a poor grade and is usually rejected
Who can measure Out-turn?	Out-turn is measured by cutting tests performed on samples of raw nuts which permit the factory manager or the exporter/importer assesses the final kernel obtainable from a given lot of raw nuts.



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Who else could verify
the quality of my raw
cashew nuts?



Training session

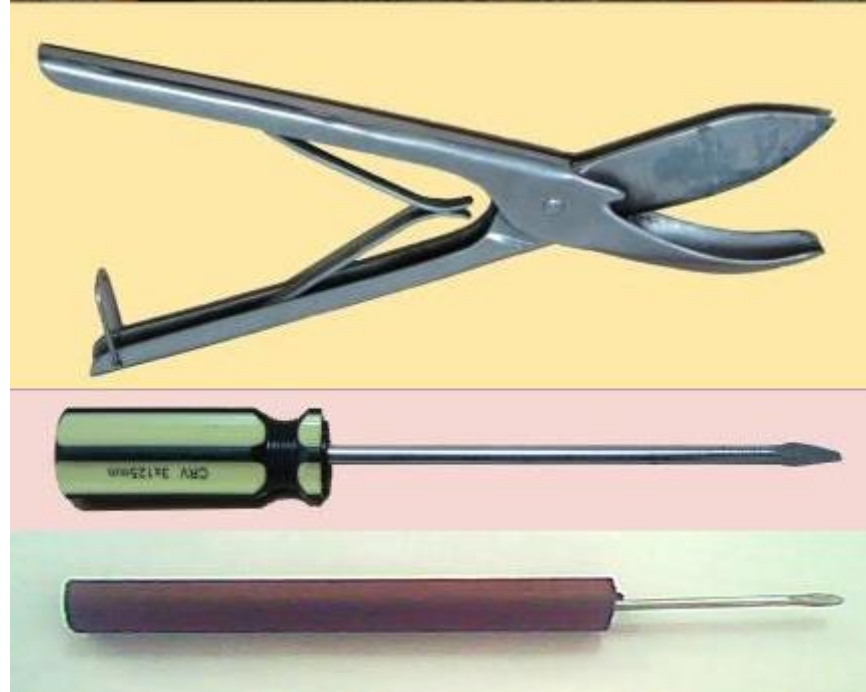
We have one specially
skilled and equipped
member in our
group/union to assess
the quality of raw
cashew nuts.



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What is needed for performing the test?



The specialist has some tools to calculate outturn of a sample of raw cashew nuts

- One scissors specially designed for de-shelling raw cashew nuts
- One scooper to scoop kernels

(could be adapted from a screw driver or made by local crafts men)



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Materials needed for out-turn test

- One electronic balance with a precision of .5 gram
- 4 differently colored bowls for kernels (green yellow, red, blue)
- Oil bowl or a pair of latex glove
- Calculator

What do I need to know about the method to understand the result of the test?

The test is done in several steps

- Taking samples
- Cutting the raw nuts
- Grading and weighing of different categories of kernels
- Performing a specific calculation
- Documenting of results



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What is important about the sampling?



Manual sampling

Sampling is the most important step in calculating outturn, and it has to be done with all cares and the characteristic of a sample are

- Sample should be well dried (8.5-9% moisture content).
- Sample should represent the characteristics of the lot.
- It should be random sample.
- Minimum weight of the sample should be 1 kg.



How many samples must be taken to be sure of the representativeness of the result?

This depends on the size of the lot, meaning the number of bags to be examined.

Lot Size (No. of bags)	No. of Bags to be sampled	No. of Samples
1 – 10	All	1
11 – 100	10	1
101 – 500	50	2
501 – 1000	10% (50 – 100)	3
Over 1000	8% (80)	5



How can we test then all these nuts if our store is full of bags?



Sample of 1kg of raw nuts being weighed

Samples drawn from various bags are thoroughly mixed and then are divided into four (4) equal portions, one such portion shall be thoroughly mixed and a random choice of 1.0 kg shall be taken for analysis.

The rest of the nuts can be returned to the stock.

How does a specially trained person calculate Out-turn from the sample of cashew nuts?

The person follows a standardized procedure.



I can not see the kernel form outside. How will the nuts be opened?



The sample nuts (shell and kernel) are cut through with the help of a specially designed scissors.

Using the cutter to split the nuts





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And then?



Two people examining the nuts



The split nut is examined in good light to examine the nature of kernel.



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How are the kernels classified?







Good kernels

Kernels with kidney shape, matured and can be consumed in totality





	 Two cashew shells are shown against a blue background. Each shell contains a light-colored kernel with several small, dark brown spots scattered across its surface.	<p>Spotted kernel</p>  <p><i>Kernels bearing dark or black spots, a part of which can be consumed</i></p>
	 Two cashew shells are shown against a blue background. The kernels inside are smaller, more irregular in shape, and appear lighter in color compared to the ones in the first row.	<p>Premature kernels</p> <p><i>Kernels not well developed, shriveled, light weight, deformed, a part of which can be consumed</i></p> 



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Bad/rotten kernels

Kernels which are rotten, mouldy and under developed, any part of which cannot be consumed

Humidified/brown kernels

During storage this turns into bad kernels



After having determined to which category each kernel belongs to, what next?



The kernel is removed from the shells with the help of the scooper, preferably without removing the peel or testa. The different kernels are put in marked bowls, one for each grade

When he finished segregating the kernels, what needs to be done then?



All different kernels are weighed separately with an electronic balance and the weight is recorded.



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Are all weights considered to determine the Out-turn?



Bowls filled with different qualities of kernels

Only the good kernels are considered as entirely useful, spotted kernels and premature kernels are also considered but only according to their estimated usefulness.

All other kernels are not considered in Out-turn calculation.

Note : Dust, external material and nut count do not affect the out-turn. They are just used to give an idea of the amount of impurities and quantity of bigger or smaller nuts in a sample.

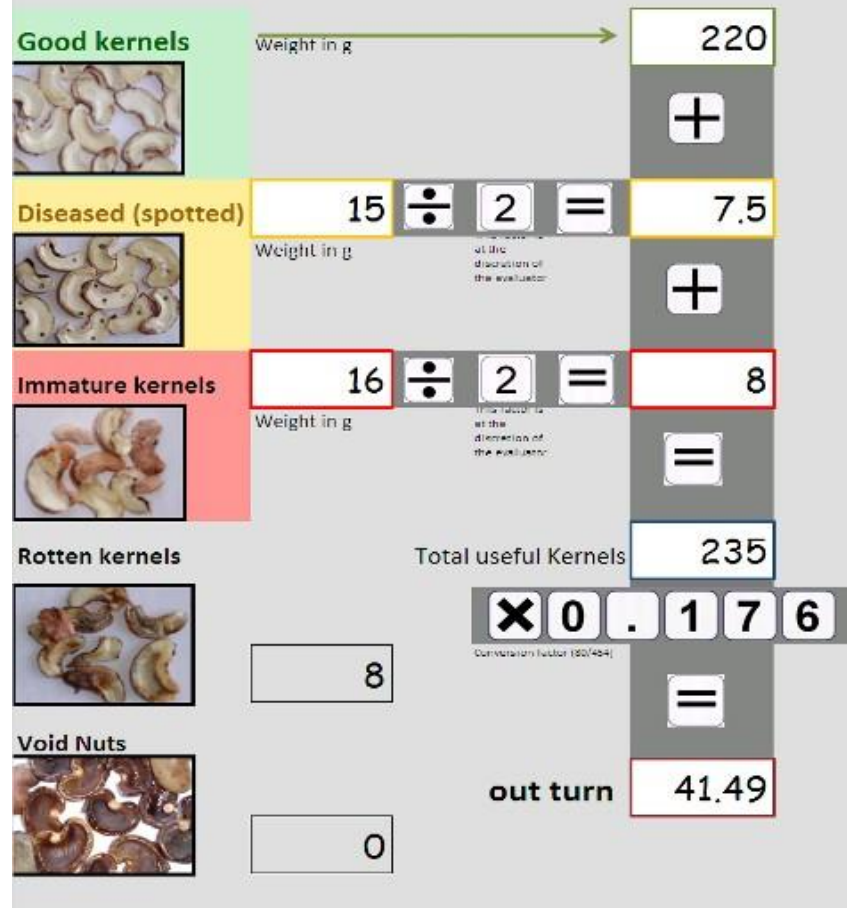


How is the calculation then done?

Is this all which needs to be done?

Thank you, I now do understand better what buyers always talk about and I can negotiate the price based on the quality of my nuts.

How to calculate "Out-turn"



$$\text{Out-turn} \left(\frac{\text{lbs}}{80\text{kg}} \right) = \text{Total useful kernels (g)} \times \frac{80 (\text{kg})}{454 (\text{g/lbs})}$$

First the amount of total useful kernels is calculated as a sum of the weight of all good kernels plus a part of the weight of the dotted kernels and premature kernels.

Then, a standard factor (of 0.176) is applied to this result to convert it into the internationally recognized unit of **Lbs quality**.

Yes it is good for us farmers to know what quality is appreciated on the market and that we get adequately paid.



Testing for Defective Nuts






It is done by cutting test using a 1 kg sample of nuts along the natural line of cleavage and all non defective nuts with non defective kernels shall be segregated without removing the kernels from the shells into the same categories as for out-turn.

- In practice 0 to 15 % max. of defective nuts is acceptable= Standard grade
- 16 to 24 % max. of defective nuts is acceptable but is under grade
- Over 24 % is not acceptable and rejected

$$\text{Total defective nuts (g)} = (\text{rotten nuts} + \text{void nuts}) + \frac{\text{immature nuts} + \text{diseased nuts}}{2}$$

$$\% \text{ of Total defective nuts} = \text{Total defective nuts (g)} \times \frac{100\%}{1000\text{g}}$$

How to calculate "defective nut"

Good Nuts	not considered	
		
Diseased (spotted)	215	
	Weight in g	
	+	
Immature Nuts	33	= ÷ 2 = 124
	Weight in g	
		+
Rotten Nuts		108
		
		+
Void Nuts		0
		
		=
Total Defective Nut :		232 _g
		÷ 10 =
% Total Defective Nut :		23,2 %



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Sample forms

(Please add details about date, name of evaluator, buyer, farmer, etc.)

How to calculate "Out-turn"

Good kernels	Weight in g								
									
Diseased (spotted)									
	Weight in g								
Immature kernels									
	Weight in g								
Rotten kernels									
									
Void Nuts									
									

at the discretion of the evaluator

at the discretion of the evaluator

at the discretion of the evaluator

Total useful Kernels

Conversion factor (80/454)

out turn



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How to calculate "% Total defective nut"

Good Nuts



not considered

Diseased (spotted)



Weight in g



Immature Nuts



Weight in g



2



Rotten Nuts



Void Nuts



Total Defective Nut :

g

10

% Total Defective Nut :

%



GENERAL QUALITY STANDARDS SPECIFICATIONS

Raw Cashew Nuts

- i. Reasonably dry: about 8 – 10% moisture content.
- ii. Kidney shaped
- iii. Colour - gray, dark grey, greenish or brownish in colour.
- iv. Healthy nuts (free from mould, etc)
- v. Free from foreign matter (max 0.5%) by weight (e.g. stones, leaves, metal piece, etc).
- vi. Max 15% defective





Kernels

- i. Reasonably dry (max 5% moisture content)
- ii. Kidney shaped
- iii. White or scorched or dessert kernels in the form of wholes or pieces
- iv. Completely free from infestation, adhering testa and objectionable extraneous matter
- v. Max 0.7% fatty acid content



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