

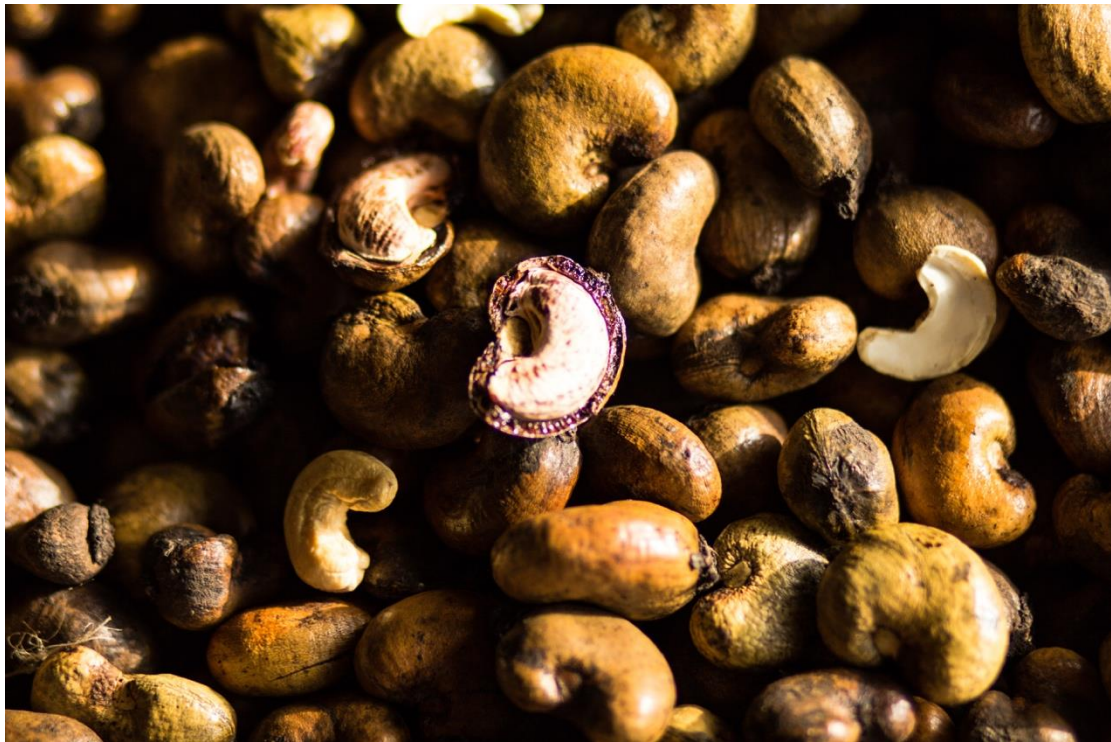
LEARNING FACILITATING MATERIALS

NATIONAL CERTIFICATE LEVEL 2

TRADE AREA: **CASHEW TRADE**

UNIT 6

PROCUREMENT OF RAW CASHEW NUTS





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UNIT INTRODUCTION

Welcome to Unit 6 of your learning journey in cashew trade. This guide explains the main steps for procuring raw cashew nuts in cashew trade.

Africa produces more than half of the world's raw cashew nuts. Ghana is emerging as a strong supplier of high-quality raw cashew nuts with a production of 110,000 MT in 2019.

Do you already know the factors to consider in procuring raw cashew nuts?

In the five to six months of cashew harvest in Ghana, traders and processors compete for large volumes of high-quality raw cashew nuts. Price negotiations take place at the farm gate, warehouse and processing factory. Quality is the main factor that determines the selling and buying price for raw cashew nuts. All buyers either process the raw cashew nuts directly or sell them to other processors in Africa and in Asia.



In this unit, you will learn about methods for purchasing raw cashew nuts as well as for testing and measuring raw cashew nut quality. The learning material covers four sub-units:

- 1) Purchasing raw cashew nuts
- 2) Kernel outturn ratio (KOR) and nut count
- 3) Warehousing raw cashew nuts
- 4) Transporting raw cashew nuts

Each sub-unit contains theoretical and practical exercises. Each module includes written materials, visuals as well as self-assessments to test your knowledge and skills.

Procuring raw cashew nuts is about purchasing high-quality raw cashew nuts at the best possible buying price, while maintaining and building business relationships with cashew farmers to secure a steady supply. Note that traders and processors only buy raw cashew nuts, if they can make a margin in trading or processing the product.

Know the market value, understand international market and pricing dynamics in order to pay fair but profit-making prices for raw cashew nuts. While securing your annual stock, it is important that everyone in the supply chain profits from cashew production, trade and processing.

Even though this learning material provides essential information on procuring raw cashew nuts in cashew trade for National Certificate Level 2, you should also look out for new information, innovations and technological advances during your practical work that expand your knowledge and skills.

Do you want to become an expert in cashew? This is your chance!

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ICONS



LEARNING
OBJECTIVES



ATTENTION



PRACTICALS
HANDS ON



CROPPING
CALENDAR



SELF ASSESSMENT



WELL DONE!



TAKE A BREAK!



DEMONSTRATE
USE OF
TOOLS

ABBREVIATIONS

Here are some commonly used abbreviations.

g	Gram (<i>1000g = 1 kg</i>)
GAP	Good Agricultural Practices
GS	Ghana Standard
lb	Pound (<i>1 lb = 0,45359 kg</i>)
lbs	Pounds (<i>1 kg = 2,20462 lbs</i>)
kg	Kilogram (<i>1 kg = 1000g</i>)
KOR	Kernel Outturn Ratio
m	Meter (<i>1 m = 100 cm</i>)
RCN	Raw cashew nuts
W	Weight

1. DEMONSTRATE SKILLS FOR PURCHASING RAW CASHEW NUTS

a) Explain purchasing raw cashew nuts

The purchase of raw cashew nuts is the process of negotiating for and buying high-quality raw cashew nuts from farmers and/or traders.

Purchasing of raw cashew nuts can take place in different locations:

- At the farm gate – the buyer comes to the farm directly for purchase
 - *The buyer purchases at a Farm Gate Price*
- At the warehouse – farmers or village traders offer products to the buyer/warehouse manager
 - *The buyer / warehouse manager purchases at a Cash-and-Carry Price*
- At the processing factory – farmers or traders offer products to the processor
 - *The processor purchases at a Cash-and-Carry Price*



Source: GLZ/ComCashew – Purchasing of raw cashew nuts in a cashew community



The purchase of raw cashew nuts takes place during harvest from January to May.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
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b) State the factors to consider in purchasing

In purchasing raw cashew nuts, consider the following factors:

- Understand the kernel price dynamics on the world market to anticipate your growing, trading or processing margins
- Understand international / regional market price dynamics and price developments throughout the harvest season
 - Prices for raw cashew nuts might be higher at the beginning of the cashew season (first, high-quality crop) and lower towards the end of the season (second, lower quality crop)
- Measure the quality of raw cashew nuts when purchasing larger volumes (20 bags and more)
 - KOR
 - Nut count
 - Moisture content
 - Defective nuts
- Develop loyalty packages to ensure farmers supply high-quality products:
 - pre-financing of farming activities (e.g. provision of improved seedlings, support in farm maintenance, farmer trainings)
 - provide premium prices through certifications such as Organic and Fairtrade
- Develop innovative payment schemes for farmers
 - Offer bonus payments to farmers that deliver high-quality raw cashew nuts
- Develop business linkages through contracts with farmers
- Develop a level of trust with the farmer to ensure steady supply

c) State different methods in purchasing

There are three (3) common methods in purchasing raw cashew nuts:

1. Farm gate Price

When purchasing raw cashew nuts at the farm gate, the buyer organises and pays for the transportation of raw cashew nuts from the farm to the warehouse or processing factory. The farm gate price is usually lower because the buyer covers the transportation costs.

2. Buying or collecting at the community level

Processors in long-term business relationships with farmers/cooperatives provide forward contracts to farmers/cooperatives who then assemble the raw cashew nuts for collection by the processor at the farmers'/cooperatives' warehouse. Raw cashew nuts may also be delivered directly to the factory gate for payment on agreed terms between the farmer groups and processors.

3. Cash-and-Carry Price

When receiving and purchasing raw cashew nuts at the warehouse or processing factory, the farmers or traders organise and pre-finance the transportation of raw cashew nuts to the warehouse or processing factory. The cash-and-carry price is usually more expensive because the farmers and traders receive a commission for collecting the raw cashew nuts in addition to the purchasing price (farm gate price) and can negotiate for an additional transportation fee.

d) **Demonstrate the appropriate use of equipment for purchasing**



Practical Exercise: Go to the farming community to purchase raw cashew nuts and demonstrate the safe use of weighing equipment.

- Use **Manual Weighing Scales** to ensure that each jute bag is filled with exactly 80 kg of raw cashew nuts.



Source: <https://www.awmlimited.co.uk/va.html>

e) Outline the procedure for purchasing

Use the checklist to follow steps 1 to 7 in purchasing raw cashew nuts. Rate your own performance critically and honestly after you have completed each activity.



Excellent



Okay



Try Again

Activities	Rate
1. Know the current market price for raw cashew nuts and know your margin	
2. Approach the seller (farmer, farmer group or other traders) to discuss procurement	
3. Weigh the raw cashew nuts	
4. Sample the raw cashew nuts	
5. Test the quality of the raw cashew nuts, if the quantities are more than 20 bags (nut count, moisture content, KOR)	
6. Negotiate with the farmer for a fair farm gate price or with the trader for a fair cash-and-carry price.	
7. Pay the farmer or trader cash or through mobile money	

Don't wish it were easier. Be better at what you are doing.

f) Purchase raw cashew nuts



Practical Exercise: Purchase a raw cashew nut batch at the farm gate.



Source: GIZ/ComCashew – Receiving and labelling jute bags at the warehouse



SELF ASSESSMENT

1. Explain purchasing raw cashew nuts.

2. State the factors to consider in purchasing.

3. State different methods in purchasing.

4. Outline the procedure for purchasing.



*Congratulations! You have completed the first set of questions.
Take a break before you move on to the next chapter.*

2. DEMONSTRATE KNOWLEDGE OF (KERNEL OUTTURN RATIO) KOR AND NUT COUNT

a) Explain KOR and Nut Count in cashew production

Kernel Outturn Ratio (KOR) refers to the amount of usable kernels after de-shelling the raw cashew nuts. It is expressed in pounds (lbs), which means the weight of the useful kernels is weighed in pounds for one 80 kg jute bag of raw cashew nuts.



1 lb = 0.45359 kg

1 kg = 2.2 lbs

Example: A kernel outturn of 49 lbs means that the processors can obtain 22.2 kg (49 lbs) of kernels from 80 kg (1 bag) of raw cashew nuts.

Nut count refers to the number of raw cashew nuts per kg. It is expressed in raw cashew nuts/kg. The nut count fluctuates between 150 and 240 raw cashew nuts/kg.



The smaller the number of raw cashew nuts, the bigger the size of the raw cashew nuts.



Combined with the outturn ratio, the nut count gives information about the kernel size after deshelling.



The bigger the size of the raw cashew nuts, the higher the outturn, and the more likely you are to get big kernels after deshelling. Big kernels are more easily sold on the world market and attract premium prices.

b) Outline the importance of KOR and Nut Count

KOR and nut count are important parameters for measuring and controlling raw cashew nut quality. Quality control of raw cashew nuts requires skills and strictness.



Remember! The higher your quality, the higher the selling price.

c) State the factors to consider in KOR and Nut Count test

The most important quality criterion is the kernel inside the shell.

- 1) Quality Benchmark for Kernel Outturn Ratio (KOR) Test
 - 49 – 52 lbs of kernels / 80 kg of raw cashew nuts
- 2) Quality Benchmark for nut count (number of nuts/kg)
 - 150 and 240 raw cashew nuts/kg

d) Demonstrate the appropriate use of KOR and Nut Count testing equipment



The first step in determining KOR and Nut Count is by assembling the required equipment and tools:

The following equipment and tools are required to calculate the KOR and nut count:

- Electronic balance with a precision of 0.5 gram
- Catheter bag
- Scissors especially designed for de-shelling (cracking) raw cashew nuts
- Scooper
- Plastic buckets
- Plastic bowls
 - Green – Good quality kernels
 - Blue – Defective (premature and spotted) kernels
 - Red – Rejects (stunted, empty, moth-eaten, mouldy, brown) kernels
- Latex gloves



Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

e) Outline the procedure in calculating KOR and Nut Count

Calculating the KOR is done in seven (7) steps and includes calculating the nut count:

- 1) Preparing materials used to calculate the outturn
- 2) Sampling or taking of the mother sample
- 3) Weighing the sample
- 4) Calculating the nut count or counting number of nuts that make 1 kg
- 5) Opening the nuts, segregation of the kernels and classification into 3 categories (good, defective and rejects)
- 6) Weighing the three categories of nuts
- 7) Calculating the KOR

Step 2: Collect the “Mother Sample”

Nuts are taken from the stock of different places:

- directly at the farmer’s place
- in local or bigger shops
- in cargos at the harbour
- in warehouses at the harbour

Quality can be checked on any nut stocks.

STEPS OF THE QUALITY CONTROL

SAMPLING :
 TO TAKE THE « MOTHER SAMPLE »

2

Nuts are taken from the stocks of different places: directly at the farmer’s place, or in local shops, or in big shops, or in cargos, or in warehouses at the harbour. Quality can be checked on any nuts stocks.

First a sample has to be taken. Sampling is an important step in calculating the Out-Turn, it has to be done carefully by following a specific process.

Examples of nuts batches:



Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?



First a sample has to be taken. Sampling is an important step in calculating the outturn; it has to be done carefully by following a specific process.

- For large volumes (30 - 40 tons), take samples from one in every 10 bags
- For small volumes (15 - 20 tons), take samples from one in every 5 bags
- For 20 bags of raw cashew nuts, take samples from every bag

The quantity of nuts taken from the entire batch is spread out on a flat surface area. This is the “mother sample”. With the help of a “quarter method”, samples are taken from the mother sample and used for the analysis.

The 3-step quarter method:

1. Mix the mother sample carefully to get a homogenous pile
2. Divide the mother sample in 4 batches “quarters”
3. Compose samples for analysis



Here a truck is unloaded at the Abidjan harbour. During the unloading of the truck, nuts are taken from bags by a sampler with a catheter bag. This sampling is generally done in one every ten bags for big batches (30-40 tons) or in one every 5 bags for small batches (15-20 tons). For the buyer, it is useful to take a sample in each bag for a better accuracy and to prevent suppliers from hiding bad-quality bags in the middle of the batch.



HOW TO TAKE
 A MOTHER-SAMPLE? **2**

The quantity of nuts taken in the entire batch is scraped up on a flat area. This quantity is the “mother-sample”. Then a sample has to be taken for its analyse. The “quarter method” has to be followed to take the sample.



Mother-sample

This is a 3-steps method: mixture of the “mother-sample”, composition of the “quarters”, and composition of the samples to analyse.

Here the sampler mixes the mother-sample; this has to be done carefully in order to get a homogeneous pile.



Mixing of the mother-sample

Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

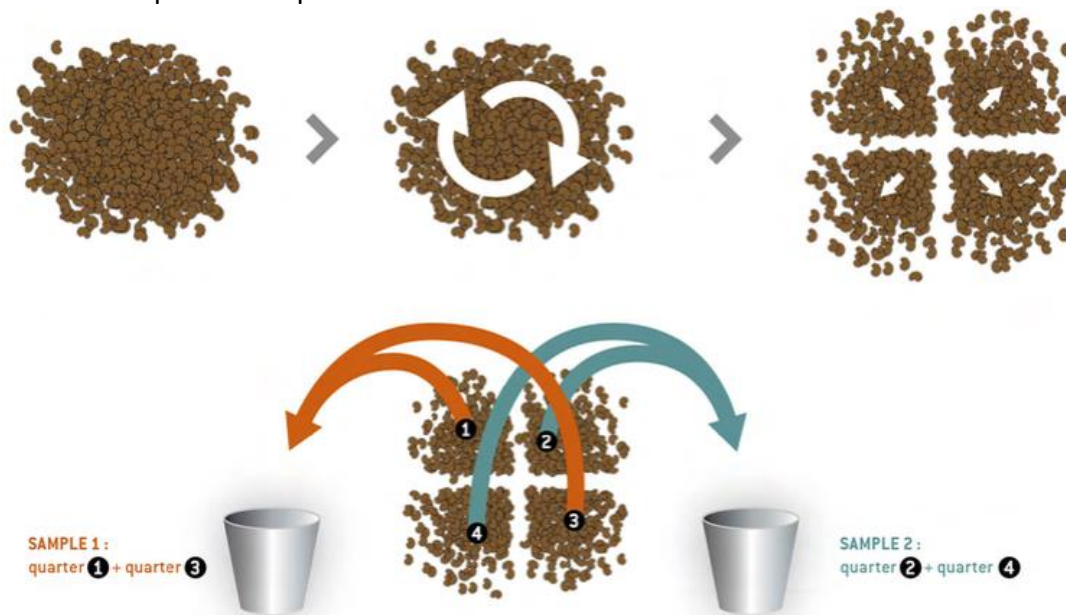
Take note of the required steps to compose the quarters for the KOR Analysis

Divide the mother sample into 4 more or less equal parts. Each part is called “quarter”. There are 4 quarters: two to two opposite.

- The first quarter is opposite to the third quarter
- The second quarter is opposite to the fourth quarter

Each sample has to come from two opposite quarters. Therefore, take small amounts of nuts from the opposite quarters and mix them in a bucket.

- Sample 1: mix quarter 1 and 3
- Sample 2: mix quarter 2 and 4



Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

HOW TO COMPOSE QUARTERS?

2

The mother-sample is divided into 4 parts more or less equal. Each part is called “quarter”. We have 4 quarters: two to two opposite.

Therefore :

- the first quarter is opposite to the third quarter
- the second quarter is opposite to the fourth quarter.

Each sample has to come from two opposite quarters. For this, we take small amounts more or less equal of nuts in the opposite quarters; we mix them in a bucket.

Thus we get :

- sample 1 from the first quarter and the third quarter
- sample 2 from the second quarter and the fourth quarter.

See next page for details



Composition of quarters



Composition of samples to analyse

Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

Step 3: Weigh the sample to obtain 1 kg for the KOR Analysis

Each sample, composed as described before, is weighed to get about 1 kg of raw cashew nuts.

Write down the weight of the sample:

$W_1 =$

The weight can fluctuate between 998g and 1002g.

STEPS OF THE QUALITY CONTROL

WEIGHING
THE SAMPLE

3

Each sample, composed like describe before, is weighed to get about 1kg of nuts. Let W_1 be the weight of a sample. .

! WRITE THE RESULT !
 $(W_1 = \dots)$

It can fluctuate between 998g and 1002g.

It can be useful to keep a witness-sample of about 1kg to check in case somebody contests the results.



Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

Step 4: Count the total number of nuts that make 1kg / Calculate the Nut Count

After weighing the sample, calculate how many nuts are in the sample



Example: For 193 nuts, make 19 piles of 10 nuts and 1 pile of 3 nuts

Write down the results:

N=

During this step, you also check for foreign matter in the batch (e.g. leaves, stones, dry apples, branches)

STEPS OF THE QUALITY CONTROL

CALCULATION OF THE NUT COUNT (NC)

4

After the weighing of the sample, we calculate how many nuts are in the sample.

During this step, we also check if foreign matters are in the batch (leaves, stones, dry apples, branches).



For each sample the nuts are brought together in small piles of ten nuts : this will avoid mistake during the counting.



Thanks to the nuts piles, this is easy to know how many nuts are in the sample by counting the number of 10-nuts piles and the extra nuts.

Example : for 193 nuts, we will count 19 piles of 10 nuts + 3 nuts

! WRITE THE RESULT !
(N = ...)

Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

Step 5: Cut the raw cashew nuts and conduct the quality analysis

Each nut (shell and kernel) of each sample is cut through – lengthwise – with the help of a specially designed scissors, into two halves.



Make sure that the two halves of each nut are kept together and that the kernels stay with the shells.

STEPS OF THE QUALITY CONTROL

OPENING OF THE NUTS, CONTROL OF THE KERNELS AND CLASSIFICATION IN THREE CATEGORIES

5



Each nut (shell and kernel) of each sample is cut through with the help of a specially designed scissors; thus we get two halves with or without flaws. The split nuts are classified according to their characteristics.

Make sure that the two halves of each nut are kept together and that the kernels stay with the shells.



Notice the position of the nut in the scissors, cut slightly the nut lengthwise, dry the scissors after each cutting.

Use gloves; the test has to be done in good light.

By observing these split nuts, we can observe the kernels and classify them into three categories :

- Wholesome kernels (100% accepted)
SEE TAB, GREEN COLOUR
- 50% rejected kernels
SEE TAB, BLUE COLOUR
- 100% rejected kernels
SEE TAB, RED COLOUR

These controlled kernels are put in the bowls according to their category.

Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

The nuts are then classified according to their characteristics:

- **Green – Good quality kernels**
 - 100 % accepted kernels
- **Blue – Defective (premature and spotted) kernels**
 - 50 % rejected kernels
- **Red – Rejects (stunted, empty, moth-eaten, mouldy, brown) kernels**
 - 100 % rejected kernels

The first and most important category of nuts is the good kernels. They are accepted 100 %.



GOOD KERNELS

WHOLESALE KERNELS DON'T HAVE ANY FLAW, THUS ALL OF THEM ARE USABLE. THESE KERNELS ARE **100% ACCEPTED**.

Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

The second category is the defective nuts. They are not fully acceptable for human consumption. They have a 50 % acceptancy rate.



SPOTTED KERNELS

THESE KERNELS HAVE HAD INSECT BITES BEFORE THE DEVELOPMENT OF THE SHELL. THUS THESE KERNELS BEAR AT LEAST ONE BLACK SPOT OR ONE BLACK MARK. PARTS THAT DON'T HAVE ANY SPOT OR MARK CAN BE CONSUMED. THEREFORE **50 % OF THESE KERNELS ARE ACCEPTED (OR REJECTED)**.



PREMATURE KERNELS

THESE KERNELS ARE SHRIVELED, NOT WELL DEVELOPED BECAUSE OF A TOO EARLY HARVEST (SOMETIMES BY PICKING).

THEREFORE **50 % OF THESE KERNELS ARE ACCEPTED (OR REJECTED)**

Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

The third and last category is rotten, oily, mouldy, stunted, brown, moth-eaten nuts and empty shells. They are 100 % rejected because they are unfit for human consumption.



Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

Step 6: Weigh the three different categories of nuts

STEPS OF THE QUALITY CONTROL

WEIGHING 6

This stage has two steps :

The weighing of **defective kernels** ; ② The weighing of **usable kernels** (kernels 100% or 50% accepted)



Good kernels are removed from the shells with the help of the scooper (or the needle) preferably without removing the peel (or testa). We get on one side kernels (with peel), and on the other side shells.

These good kernels are the "100% accepted kernels".

They are put into the **green** bowl.

These good kernels are weighed with their peel. Let W_1 be the total weight of the good kernels.

! WRITE THE RESULT !
 $(W_2 = \dots)$



Weight the kernels+shells of the categories (premature and spotted). Let W_3 be the total weight of the nuts (kernels+shells) 50% accepted.

$W_3 =$ weight of the spotted kernels + weight of the premature kernels (kernels + shells)

! WRITE THE RESULT !
 $(W_3 = \dots)$

Then, the kernels (premature and spotted) are removed from their shells. All these kernels are "the 50% accepted (or rejected) kernels". They are put into the **blue** bowl.

The kernels (premature and spotted) are weighed. Let W_4 be the total weight of the 50% rejected kernels.

! WRITE THE RESULT !
 $(W_4 = \dots)$



In the same way, each other category of defective kernels (mouldy, brown, moth-eaten, empty, and stunted) is weighed with the shells. Let W_5 be the total weight of the nuts (kernels+shells) 100% rejected.

! WRITE THE RESULT !
 $(W_5 = \dots)$

Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

Green Category

Remove the good kernels from the shell with the help of the scooper.

You will get:

- Half kernel with testa
- Half shell

The good kernels are accepted 100 %. Place them in the green bowl and weigh.

Write down the weight of good kernels with the testa without the shell.

$W_2 =$

Blue Category

Write down the weight of the spotted and premature kernels with shells

$W_3 =$

Afterwards, remove the spotted and premature kernels from their shells. The spotted and premature kernels are accepted 50 %. Place them in the blue bowl and weigh.

Write down the weight of the spotted and premature kernels without shells.

$W_4 =$

Red Category

The defective kernels are 100 % rejected. Place them in the red bowl and weigh.

Write down the weight of the defective, stunted, empty, moth-eaten, mouldy, brown kernels with shells

$W_5 =$

f) Determine KOR and Nut Count



Practical Exercise: Conduct the KOR calculations and nut count to determine the quality parameters of a raw cashew nut batch.

Step 7: Calculation of KOR. This is the final step of the KOR analysis.

STEPS OF THE QUALITY CONTROL

CALCULATIONS

Calculation of the Nut Count

This is the number of nuts per kilogram. It is calculated by dividing the number of nuts in the sample by the weight of this sample: we obtain the value of the grain. The grain gives information about the average size of the kernels. The bigger is the grain value, the more there are nuts in one kilo and so the smaller are the nuts.

With :

- W_1 : the weight of the sample
- N : the number of nuts counted in one sample (see tab 4)

$$\text{Nut Count} = N / W_1$$

Calculation of the total defective rate

To calculate the defective rate, you have to use the followings formula with the data from the weighing (see tab 5).

With :

- W_1 : the total weight of the nuts sample
- W_2 : the weight of the 100% rejected nuts
- W_3 : the weight of the 50% rejected nuts

The defective rate is :

$$(W_2 + W_3) / W_1 \times 100$$

Calculation of the kernels productivity and of the Out-Turn

To calculate the kernels productivity, you have to use the followings formula with the data from the weighing. (see tab 6).

With :

- W_1 : the total weight of the nuts sample
- W_2 : the total weight of kernels+peels of 50% rejected nuts
- W_3 : the total weight of kernels+peels of the good kernels

$$\% \text{ of useful kernels} = (W_2 + W_3 / 2) / W_1 \times 100$$

For the processors, all reasoning connected to the purchase and the processing of cashew nuts are conducted on the base of a 80 kg-nuts bag and of a weight of kernels expressed in pounds (lb).

Thus the productivity Ra becomes the Out-Turn with the following conversion :

$$\text{Out-Turn} = \% \text{ of useful kernels} / 100 \times 80 \times 1 / 0,45359$$

EXPLANATION

- The productivity in % is converted in a value expressed in weight/weight (for that, we divide % of useful kernels by 100)
 - To reason with 80kg-nuts bag, we multiply by 80
 - To get a value in pounds, we divide by the value of one pound in kg (1lb=0.45359 kg)
- In practice, the values of the Out-Turn fluctuate between 40 and 50 lbs per 80 kg of nuts. When the Out-turn is high, the batch has a good quality.

GOOD QUALITY = GOOD PRICE

Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

Calculation of the Nut Count

This is the number of nuts per kilogram. It is calculated by dividing the number of nuts in the sample by the weight of the sample to obtain the value of the grain.



The grain gives information about the average size of the kernel. The bigger the grain value, the more nuts there are in one kilo, the smaller are the nuts and the lower is the quality.

To calculate the nut count, you have to use the following formula:

- W_1 – total weight of the nut sample
- N – number of nuts counted in one sample

$$\text{Nut count} = N / W_1$$

Calculation of the total defective rate

To calculate the defective rate, you have to use the following formula with the date of weighing:

- W_1 – total weight of the nut sample
- W_3 – total weight of the 50 % rejected nuts
- W_5 – total weight of the 100 % rejected nuts

$$\text{Defective rate} = (W_3 + W_5) / W_1 \times 100$$

The image shows two side-by-side screenshots of a digital scale interface used for calculating the total defective rate of cashew nuts. Each screenshot displays a 'Not considered' category for unusable nuts and a 'Weight in g' category for usable kernels. The left screenshot shows a total weight of 195g, with 33g of useless kernels, resulting in 114g of useful kernels and 23% of useless kernels. The right screenshot shows a total weight of 116g, with 10% of useless kernels.

Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

Calculation of the kernel's productivity and of the outturn

To calculate the kernels productivity, you have to use the following formula with the date of weighing:

- W_1 – total weight of the nut sample
- W_2 – total weight of good kernels and testa
- W_4 – total weight of kernels and testa of the 50 % rejected kernels

$$\% \text{ of useful kernels} = (W_2 + W_4 / 2) / W_1 \times 100$$

Kernel Outturn Ratio (KOR)

- The productivity in % is converted in a value expressed in weight / weight (for that, you divide % of useful kernels by 100)
- To reason with 80 kg nuts bag, multiply by 80
- To get the value in pounds, divide by the value of one pound in kg (1 lb = 0,45359 kg)

$$\text{Outturn} = \% \text{ of useful kernels} / 100 \times 80 \times 1 / 0,45359$$

CALCULATION OF THE OUT-TURN

Weight in g 264

Weight in g 15 \div 2 = 7,5

Weight in g 24 \div 2 = 12

All useful kernels 283,5

Not considered \times 0,176 =

OUT TURN 49,9

OUTTURN $\left(\frac{\text{lbs}}{80\text{kg}}\right) = \text{All useful kernels (g)} \times \frac{80 \text{ (kg)}}{454 \text{ (g/lbs)}}$

OUT-TURN

Weight in g [] \div 0,45359 = []

Weight in g [] \div 2 = []

Weight in g [] \div 2 = []

All useful kernels []

Not considered \times 0,176 =

OUT TURN []

OUTTURN $\left(\frac{\text{lbs}}{80\text{kg}}\right) = \text{All useful kernels (g)} \times \frac{80 \text{ (kg)}}{454 \text{ (g/lbs)}}$

Source: GIZ/ComCashew – Technical Manual: How to estimate the quality of raw cashew nuts?

In practice the value of the Kernel Outturn fluctuates between 49 – 52 lbs per 80 kg of nuts.

When the Kernel Outturn is high, the batch has a good quality.



Remember! The Ghana Standard for raw cashew nuts and kernels (GS 220) provides guidelines on cashew quality. This standard is based on the Codes Alimentarius for stakeholders working in the cashew sector in Ghana. Consult the GS 220 for more details.



SELF ASSESSMENT

1. Explain KOR and Nut Count in cashew production.

2. State the factors to consider in KOR and Nut Count test.

3. Outline the procedure in calculating KOR and Nut Count.



Well done! You are doing great on your path to success. Results happen over time, not over night. Work hard, stay consistent and be patient.

3. DEMONSTRATE SKILLS FOR WAREHOUSING RAW CASHEW NUTS

a) Explain warehousing of raw cashew nuts

Storage of raw cashew nuts involves the systematic stacking of 80 kg jute bags, filled with raw cashew nuts on pallets in a ventilated warehouse.

Storage requirements depend on weather conditions. Raw cashew nuts are usually produced in climates with a long dry season. Thus, simple buildings with concrete floors and walls, and roofs of corrugated metal provide adequate storage.



Source: GIZ/ComCashew – Placing jute bags on wooden pallets for storage



Remember! Raw cashew nuts must be dried at a moisture content of 9 % or below, packed and sealed in jute bags for storage. The jute bags are stalked on a pallet.



An appropriate storage system for raw cashew nuts is important to store raw cashew nuts for 12 months or more.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
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b) State the importance of warehousing

Warehousing is important because cashew nuts are only sold during the harvest season - from January to May/June. However, processors must process raw cashew nuts throughout the entire year to stay profitable. Storing raw cashew nuts for at least 6 months enables processors to buy large volumes of raw cashew nuts in the harvest season and to store them until further processing from June to December. Processors store RCN bought until the next harvest season.



Source: GIZ/ComCashew – Storage of RCN in warehouse

c) State the factors to consider in warehousing

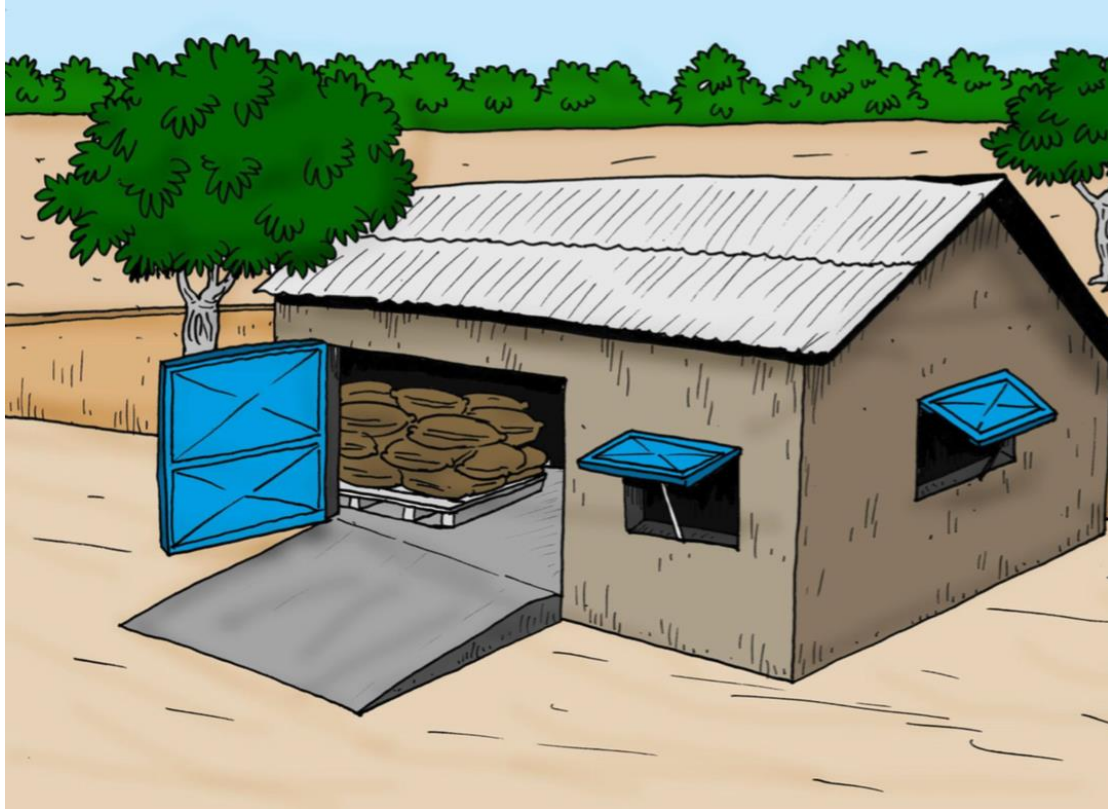
There are ten (10) factors to consider in setting up a safe storage structure and system for storing raw cashew nuts:

1. A waterproof, dry floor
2. A firm and secure metal roof
3. Openings in the wall must be protected in order to prevent water from entering the room
4. A space of 1.5 m between the packed jute bags, the roof and the walls of the storage
5. Allow air to circulate freely
6. The store should be easy to inspect
7. Allow stacks to be moved around, if large quantities are to be stored
8. Allow sufficient space for individuals to walk around and check the condition of the stack
9. Place stacks on raised wooden platforms / pallets to prevent moisture from the floor from entering the nuts
10. Label the different stacks of products according to sourcing origin and initial date of storage



Sell the raw cashew nuts within the same year of harvest to prevent quality loss. Nuts kept until the following season are of much lower quality. You might run the risk of not being able to sell your raw cashew nuts at all.

Always store raw cashew nuts in a dry and ventilated warehouse.



Source: GIZ/ComCashew – Warehouse for proper storage of raw cashew nuts

Do not store raw cashew nuts:

- outside without protection from rain
- in a hot room

Infestation can also occur at various stages of handling raw cashew nuts, especially during inappropriate storage. Infestation can go undetected until the damage has progressed to the point of heavy product loss. Maintain good warehouse practices!

d) **Demonstrate the appropriate use of equipment for warehousing**



The following tools and materials are required for storage:

- Use **wooden pallets** to raise jute bags off the floor to prevent moisture from the floor from entering the nuts. Arrange pallets with sufficient space from the walls, roof and other stacks to ensure ventilation.



Source: <https://www.universalpallets.com/product/4-way-entry-standard-size-conversion-pallet/>

- **Jute bags** are most appropriate for storing raw cashew nuts. Jute bags allow air to flow through. You can use former **cocoa jute bags** to store raw cashew nuts.



Source: GIZ/ComCashew – Jute Bags appropriate for storing raw cashew nuts

- Use **Wooden Sign Boards** to label each stack according to sourcing origin and initial date of storage.



Source: <https://www.indiamart.com/proddetail/wooden-sign-board-14857621348.html>

e) Outline the procedure for warehousing raw cashew nuts

Use the checklist to follow steps 1 to 6 in warehousing raw cashew nuts. Rate your own performance critically and honestly after you have completed each activity.



Excellent



Okay



Try Again

Activities	Rate
1. Clean up the warehouse and prepare for raw cashew nut storage.	
2. Place wooden pallets on the floor	
3. Arrange pallets with 1.5 m space to the walls of the storage and a 1 m gap between the stacks	
4. Place jute bags on the pallets	
5. Stack jute bags not higher than 4 m to ensure stability	
6. Label stacks of raw cashew nuts. Remember to separate certified (organic or Fairtrade) and conventional RCN	

You don't always get what you wish for, but you always get what you work for.

f) Undertake warehousing of raw cashew nuts



Practical Exercise: Go to the processing factory or warehouse to store raw cashew nuts.



Source: GLZ/ComCashew – Organic certified raw cashew nuts in a ventilated warehouse



SELF ASSESSMENT

1. Explain warehousing of raw cashew nuts.

2. State the importance of warehousing.

3. State the factors to consider in warehousing.

4. Outline the procedure for warehousing raw cashew nuts.



Congratulations! You have completed more than half of this training unit already. Our greatest glory is not in never falling but in rising every time we fall.

4. DEMONSTRATE KNOWLEDGE OF TRANSPORTING RAW CASHEW NUTS

a) Explain transportation of raw cashew nuts

Transportation of raw cashew nuts is the process of stacking 80 kg jute bags of raw cashew nuts on a vehicle or in a container to drive or ship the product from one destination to another.

b) State the means of transportation

There are different means of transporting raw cashew nuts in-country:

- Bicycle (maximum 2 bags) – from a village to a warehouse
- Saloon Car / Taxi (maximum 4 bags) – from a village to a warehouse
- Motorbike (maximum 2 bags) – from a village to a warehouse
- Motor King (maximum 8 bags) – from a village to a warehouse



Source: <http://www.motorkingltd.com/>

- Trucks (500 bags) – from the warehouse to the port



Source: GIZ/ComCashew – Stacked jute bags on truck

In international trade, raw cashew nuts are shipped by boat in large and ventilated containers.



Source: GIZ/ComCashew – Containers ready for shipment

c) State the factors to consider for transporting

The factors to consider in transporting are:

- Prepare documents for transportation
 - Material transfer note
 - License plate of the truck
 - Number of bags
 - Weight
 - Information on the Driver
- Hire day labourers to load the truck
- Stack bags at a safe height of not more than 7 bags
- Secure bags with strong ropes
- Protect bags from harsh weather conditions such as rain and sun with a cover
- Hire a professional, well-rested and experienced driver
 - Usually an employee from the warehouse escorts the driver to the final destination e.g. processing factory or port
- Good communication with authorities at the port, in case the raw cashew nuts are supposed to be shipped overseas



Source: GIZ/ComCashew – Loaded jute bags on truck

d) Outline the procedures for transporting

Use the checklist to follow steps 1 to 6 in transporting raw cashew nuts. Rate your own performance critically and honestly after you have completed each activity.



Excellent



Okay



Try Again

Activities	Rate
1. Prepare material transfer note	
2. Inform the authorities about the arrival time and volumes of raw cashew nuts, e.g. at the port	
3. Load the truck by stacking the bags on top of each other. Do not overload the truck!	
4. Secure the bags on the truck with strong ropes and cover the bags to protect them from rain and sun	
5. Check the condition of the driver before the trip. Ensure that the driver is well-rested!	
6. Send an escort with the driver	

Don't wait for an opportunity. Create it!

e) **Demonstrate transportation of raw cashew nuts**



Practical Exercise: Go to the warehouse and prepare transportation documents for raw cashew nuts.



Source: GIZ/ComCashew –Raw cashew nuts transported on truck



SELF ASSESSMENT

1. Explain transportation of raw cashew nuts.

2. State the means of transportation.

3. State the factors to consider for transporting.



Bravo! You have completed this entire unit.

REFERENCES

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