5.2.2

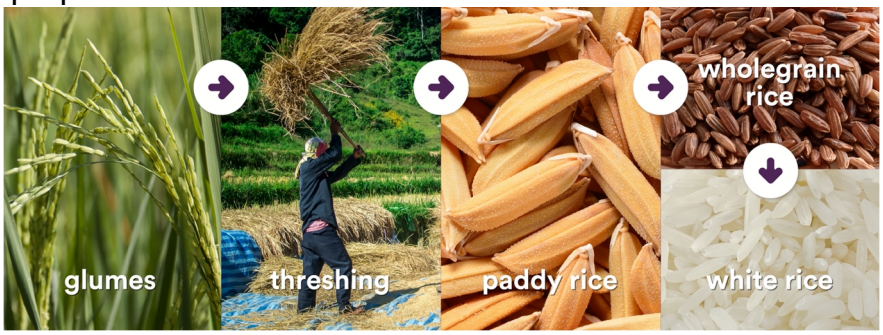
Rice and corn: Harvest and storage

Let's move on to see how rice and corn are harvested and stored.

HARVEST

Rice grows in ears, in envelopes called glumes.

Once rice has been harvested, it needs to be threshed to separate the glumes from the ear of rice. This process can be carried out either manually, or with the help of animals, or by using machines. This step releases what is referred to as **paddy rice**. The husk covering paddy rice is hard and inedible. Once it has been removed, we get what is called **wholegrain rice**, **brown rice** or **cargo rice**, which has many nutritional properties.



Removing the germ and the bran (another envelope that covers the grain) gives **white rice**. The grains are then parboiled.

What about corn? It can be harvested either in cobs or as kernels, but it is now more commonly harvested as kernels. This entails a process called shucking, to separate the kernels from the cobs. The corn is then hulled to remove part of the germ and the bran.

Corn can also be consumed in its original state, i.e. without having undergone any transformations.

DRYING

After harvesting and threshing, grains of rice and kernels of corn usually still have a high water content, which promotes the growth of mould and bacteria. So, they must be dried. This step is also called desiccation..

There are two main methods for drying rice: natural drying and artificial drying.

Natural drying consists essentially of exposing the grains of rice to air, sun or shade. This method is suitable for small quantities of rice, but may be limited by the climate. Natural drying is not recommended in humid regions or during the rainy season. Moreover, if drying is insufficient or too slow, it can cause significant losses.

The technique for **drying rice artificially** was developed in order to dry the grains faster, in greater quantities, and without relying on the climatic conditions. However, this method requires the purchase of dryers and the use of fuel so it is more complex than natural drying and more costly in terms of energy.

There are also several methods for drying corn: natural drying on the stalk, drying on the cob and drying kernels.

Natural drying on the stalk means that, before harvesting, corn is left to dry for several weeks after it has reached maturity but whilst still on its stem. This simple method has major disadvantages: The corn remains in the field, delaying the preparation of the soil for another crop, and rodents, birds and insects may attack the cobs.

Drying corn whilst still on the cob, but after harvesting, avoids these disadvantages. The cobs are hung in an area where air circulates freely. Natural ventilation is often inadequate, especially in humid regions so, in many cases, artificial ventilation is required.

Drying kernels of corn is carried out after shucking. Since kernels of corn are very moist, they deteriorate very quickly, so artificial dryers are often used to speed up the process. This method makes it possible to dry large quantities of corn in a relatively short period of time.

STORAGE

After rice and corn have been dried, they are then stored.

The main objectives of storage are to allow the deferred use of agricultural products and to guarantee a regular and continuous supply for processing industries. Storage also serves to balance the supply and demand of agricultural products on a commercial basis, thereby stabilising market prices.

Most of the time, rice and corn are stored in **bags** for transportation and sale.

However, in large collection centres, ports or large processing sites, rice and corn are stored in **bulk** in warehouses or in silos. Such large facilities can hold up to 15 000 cubic metres, equivalent to five Olympic swimming pools. They require ventilation to maintain a suitable temperature and especially a low level of humidity. This can represent a significant energy cost, as storage of 15 000 tonnes of rice or corn in silos consumes about 160 000 kilowatts per year.

5.2.2

Rice and corn: History, cultivation techniques

After harvest, rice is threshed to obtain...

- O wholegrain rice
- O white rice
- O paddy rice

Drying rice and corn after harvest...

- O develops better flavour
- O ensures they keep better
- O makes them less sticky

Corn can be left to dry in the field, before it is harvested.

- O True
- O False

Why do we store rice and corn?

- O To dry them
- O To guarantee a continuous supply
- O To be used to sow land for future harvests

Storage silos can be very big, holding up to 15 000 m3 of rice or corn. That is equivalent to the volume of...

- O 5 Olympic-size swimming pools
- O 1 tanker
- O 115 bathtubs

Answers

After harvest, rice is threshed to obtain...

- ○ **wholegrain rice**
  Wrong! Rice needs to undergo another stage before it becomes wholegrain rice, also called brown rice or cargo rice.
- ○ **white rice**
  Wrong! White rice is obtained by removing the germ and bran from wholegrain rice.
- ● **paddy rice**
  Well done! Paddy rice is unprocessed rice that still has its hard inedible husk.

Drying rice and corn after harvest...

- ○ **develops better flavour**
  Wrong! This is not the reason for drying rice and corn.
- ● **ensures they keep better**
  Well done! Rice and corn have a high water content, which favours the growth of mould and bacteria. It is therefore better to dry rice and corn if they are to be kept for any length of time.
- ○ **makes them less sticky**
  Wrong! Try again.

Corn can be left to dry in the field, before it is harvested.

- ● **True**
  Well done! This is called natural drying on the stalk and does not require any drying facilities. However, the downside is that the field remains occupied and rodents, birds or insects may attack the cobs.
- ○ **False**
  Wrong! Try again.

Why do we store rice and corn?

- ○ **To dry them**
  Wrong! Rice and corn have to be dried before they are stored, otherwise mould and bacteria could develop.
- ● **To guarantee a continuous supply**
  Well done! That's right! Maintaining stocks of rice and corn guarantees a supply throughout the year.
- ○ **To be used to sow land for future harvests**
  Wrong! Although some rice and corn may be set aside to be used as seeds, there is another reason for storing them.

Storage silos can be very big, holding up to 15 000 m3 of rice or corn. That is equivalent to the volume of...

- ● **5 Olympic-size swimming pools**
  Well done! These silos really are huge!
- ○ **1 tanker**
  Wrong! A tanker only holds 38 m3.
- ○ **115 bathtubs**
  Wrong! 115 bathtubs would only hold about 60 m3.

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Drying techniques

[14-16 years old]

Give the names for the various techniques used for drying rice and corn.

1. A drying technique where corn is left to dry on the plant for several weeks after it has reached maturity before harvesting it.
   _____
2. A technique for drying corn after it has been harvested. The cobs are hung where air circulates freely.
   _____
3. A technique for drying corn, carried out after shucking.
   _____
4. A drying technique where grains of rice are exposed to the air, in sun or shade.
   _____
5. A technique for drying grains of rice faster, in greater quantities, and without being dependent on weather conditions.
   _____

Answers

Drying techniques

[14-16 years old]

Give the names for the various techniques used for drying rice and corn.

1. A drying technique where corn is left to dry on the plant for several weeks after it has reached maturity before harvesting it.
   Natural drying on the stalk

2. A technique for drying corn after it has been harvested. The cobs are hung where air circulates freely.
   Drying corn whilst still on the cob

3. A technique for drying corn, carried out after shucking.
   Drying kernels of corn

4. A drying technique where grains of rice are exposed to the air, in sun or shade.
   Drying rice naturally

5. A technique for drying grains of rice faster, in greater quantities, and without being dependent on weather conditions.
   Drying rice artificially