

When processed and cooked ...

What happens to radioactive cesium in food during processing and cooking?

Does it decrease?

Does it increase?

Radioactive cesium (Cs) in food is removed or its concentration by weight changes during processing and cooking.

A

How to remove radioactive Cs from the edible part of food



Peel vegetables and fruit and remove skin and bones from fish and meat. This removes radioactive Cs from the edible parts.



Radioactive Cs is also readily soluble in water. Boil, broil, or soak food, so that radioactive Cs moves from the food into water and is thereby removed from the edible parts of the food.

Changes in radioactive Cs concentration by cooking

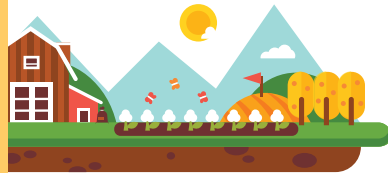
The radioactive Cs concentration changes when,

- 1 Radioactive Cs is removed
- 2 The weight of the edible part of food is altered

For 2, drying or addition of water or sugar leads to changes in the weight of the edible part of food. As the weight of the edible part increases, Cs concentration decreases, and as the weight decreases, Cs concentration increases.

Research by NARO on countermeasures against radioactive materials

NARO is engaged in research on measures to reduce radioactive materials in food at each stage of production: starting on the farm, where radioactive materials are present in the environment, continuing during cultivation and breeding, and through to the table.



Research on monitoring and removal of radioactive materials from the environment

Studies to curb the transfer of radioactive cesium to agricultural and livestock products



Studies to investigate changes in radioactive cesium during food processing and cooking



Unit of radioactive cesium concentration 「Bq/kg」

The unit that represents the amount of radioactivity is the Becquerel (Bq). "Bq/kg" (becquerel per kg) is used to indicate the concentration of radioactive cesium in food.

Food Research Institute, National Agriculture and Food Research Organization (NARO)



<http://www.naro.affrc.go.jp/nfri-neo/contents/nfriwg/riwg/index.html>
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RADIOACTIVE CESIUM IN FOOD

What happens to radioactive cesium in food during processing and cooking?

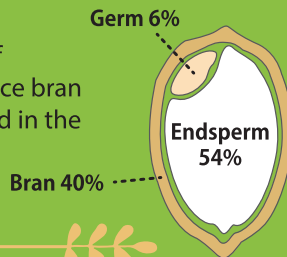


RICE

Radioactive cesium concentration in brown rice is reduced by removing rice bran and cooking the rice!



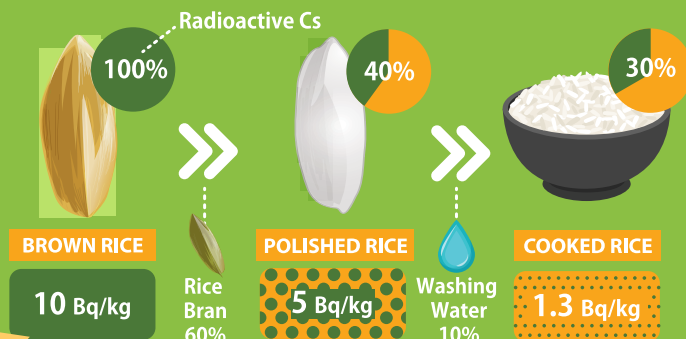
In brown rice, approximately 60% of radioactive cesium (Cs) is found in rice bran or rice germ, and about 40% is found in the endosperm (the white rice part).



The radioactive Cs concentration in rice is reduced when rice bran is removed or when the rice is cooked.

When rice bran is removed from brown rice, radioactive Cs is removed together with the rice bran. So, only about 40% of radioactive Cs remains in polished rice.

Also, as radioactive Cs is water-soluble, when rice is washed before cooking, 10% of radioactive Cs present in the polished rice or residual rice bran is transferred to the washing water. Therefore, only about 30% of the radioactive Cs contained in brown rice remains in the cooked rice we



Percentage of radioactive cesium removed during processing from brown rice to cooked rice (%)

If brown rice with 10 Bq/kg of radioactive Cs is processed into polished rice, the radioactive Cs concentration is reduced to 5 Bq/kg. When boiling 5 Bq/kg polished rice, the radioactive Cs concentration is reduced to 1.3 Bq/kg. This is because the water that enters the rice while cooking and make it soft and easy to eat increases the weight of the rice.

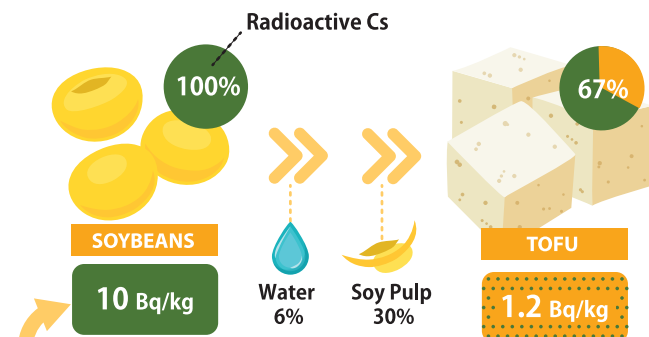
SOYBEANS



Radioactive Cs in soybeans is reduced during processing and cooking, but not during fermentation with natto bacteria.

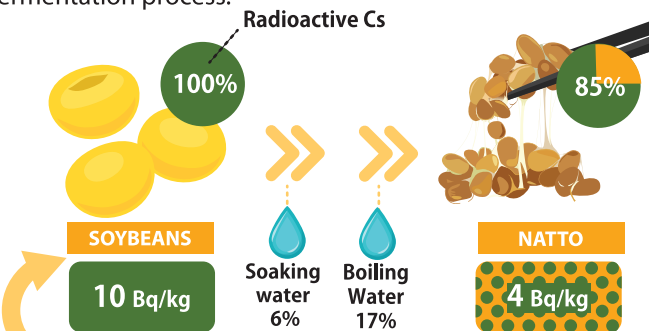
When soybeans are processed into tofu or natto, the radioactive Cs concentration becomes lower than that in raw soybeans.

Approximately 30% of radioactive Cs in soybeans is removed through the soy pulp when the soybeans are processed into tofu.



If soybeans with 10 Bq/kg radioactive Cs concentration are processed into filling tofu, the final radioactive Cs concentration will be 1.2 Bq/kg.

When processed into natto, approximately 17% of radioactive Cs is removed from soybeans in the water drained off after steaming. To make natto, soybeans are fermented with natto bacteria, but the amount of radioactive Cs is not changed during this fermentation process.



If soybeans with 10 Bq/kg radioactive Cs are processed into natto, the final radioactive Cs concentration is reduced to 4 Bq/kg.

Percentage of radioactive cesium removed while processing soybeans into natto and tofu (%)

UDON

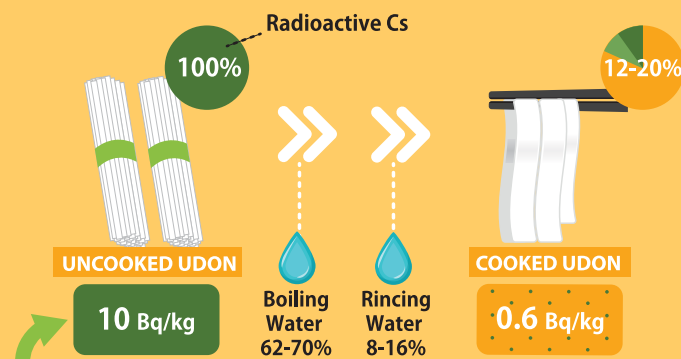


The best boiling duration for udon in your recipes is also the best duration for reducing radioactive Cs.

When you cook udon noodles by boiling them for a suitable duration, the concentration of radioactive Cs is lower than that before boiling.

Radioactive Cs is readily soluble in water. For this reason, boiling food in water moves Cs from the food to the boiling water, thereby removing Cs from food.

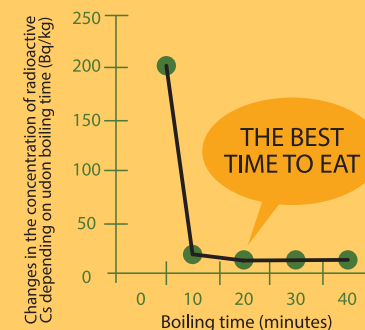
When boiling raw udon noodles, about 70% of the radioactive Cs is transferred to the boiling water and about 16% to the rinsing water. Only about 20% of the original amount of radioactive Cs will remain in the boiled udon noodles we eat.



10 Bq/kg radioactive Cs in raw udon noodles is reduced to 0.6 Bq/kg radioactive Cs after boiling.

Percentage of radioactive cesium removed during boiling to cook udon (%)

However, boiling for longer than the recommended boiling duration in recipes will not further reduce the radioactive Cs concentration.



The best boiling duration to make tasty udon is sufficient to reduce the amount of radioactive Cs.

*We used wheat specially cultivated in a test field in 2011 for the raw materials.