



- green biotechnology -

# GOLDEN RICE

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[https://en.wikipedia.org/wiki/Golden\\_rice](https://en.wikipedia.org/wiki/Golden_rice)

## What is Golden Rice?

Golden rice was developed to solve a big problem mostly in Asia or other places where there is a shortage of vitamin A. It is a type of rice that is genetically engineered. The difference between the white rice and the golden rice is the amount of vitamin A that is produced by the addition of three beta-carotene biosynthesis genes. There is also golden Rice 2 that is still in development now. This new type of golden rice produce 23 times more beta-carotene than the original golden rice did.

## How is the rice modified:

To produce and store beta-carotene the rice is genetically engineered with 3 genes. This three genes will produce the vitamin A. This genes, along with promoters, are inserted into plasmids, small pieces of DNA. They add the agrobacteria into a petri dish which contains rice embryos. When agrobacteria infect the embryos they also transfer the genes that encode the instruction for making beta-carotene.

## Why is golden rice so important ?

The development of the Golden rice is to decrease the deficiency of Vitamin A. This vitamin is very important for children. When you don't have enough Vitamin A in your younger years you could be diagnosed with blindness, Xerophthalmia (your eyes can't produce tears that can lead to blindness) and even to death.



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## The upsides and the downsides:

### Two German economists have quantified:

- The price of the opposition, in human health. Their study estimates that the delayed application of Golden Rice in India alone has cost 1,424,000 life years since 2002. Not only death is quantified but blindness as well.

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### Greenpeace says:

- That Non-GMO organic, traditional and conventional plants would be at a high risk of contamination by the Golden rice, if this GMO rice were released into the environment. Because this GMO will damage the fields.
- The production and use of golden rice citing this GMO will encourage the development of more GMOs in the future.