

# Titanium Dioxide as a Food Additive

## Summary



A FSANZ review of the safety of food-grade titanium dioxide has found no evidence to suggest dietary exposure to the additive is a concern for human health.

### ***What is titanium dioxide?***

Titanium dioxide is a natural pigment that has been used for decades as a colouring agent to make foods whiter or brighter. In Australia and New Zealand it is allowed to be added to a wide range of foods. Multiple reviews by FSANZ and regulators overseas have concluded there are no safety concerns from its use in food.

### ***Why we did this work***

In 2021 the European Food Safety Authority (EFSA) published a new report which concluded titanium dioxide could no longer be considered safe.

EFSA's report noted there is no conclusive evidence that titanium dioxide is harmful, but raised concerns that some studies suggest it may damage DNA. Because of this, EFSA decided they were not able to set an amount of titanium dioxide that could be safely consumed each day.

Given the concerns raised, FSANZ reviewed key evidence relating to the safety of titanium dioxide when used in food.

### ***How we did our assessment***

We reviewed the scientific literature to find studies assessing the safety of titanium dioxide in food. This included studies in both laboratory animals and in humans.

We also issued a call for information on the safety of titanium dioxide. The information we received included new scientific data that addressed some of the concerns raised by EFSA.

### ***What the assessment looked at***

Titanium dioxide can be found in several forms, with only some used in food. The forms used in food are known as food-grade titanium dioxide.

The recent safety concerns are mainly based on studies into forms of titanium dioxide that either:

- are not used in food and have different properties to food-grade titanium dioxide, or
- are food-grade titanium dioxide that had been broken down into smaller sized particles than normally used in food, and given to animals in water rather than in food as part of their diet.

Our review mainly focused on studies where food-grade titanium dioxide was fed to animals in their diet, without being broken down into smaller particles. These studies are more

relevant to how humans are exposed to titanium dioxide in food. Other studies were used as supporting information.

### ***What we found***

Absorption of food-grade titanium dioxide following ingestion in food is very low. Recent studies with food-grade titanium dioxide in rats suggest that less than 0.01% of the amount eaten is absorbed.

In animal studies there is no evidence of DNA damage from food-grade titanium dioxide. There is also no evidence of cancer or other harmful effects in studies with mice and rats fed diets containing very large concentrations of food-grade titanium dioxide over their lifetime.

Additional studies with food-grade titanium dioxide in rats found no evidence of general toxicity, and no harmful effects on reproduction, development or the gastrointestinal, immune and nervous systems.

### ***What this tells us***

Currently, there is no evidence to suggest dietary exposure to food-grade titanium dioxide is a concern for human health.

### ***Next steps***

As no safety concerns were found, no action is required to review the current permissions for the use of titanium dioxide in food in Australia and New Zealand.

We will continue to monitor new information on the safety of titanium dioxide in food as it becomes available.

### ***More information***

FSANZ's review of the safety of titanium dioxide