Are zinc levels in tinned tuna ‘wreaking havoc’ on your gut?

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No, you can relax-your gut will be fine.

Recent media headlines claim that tinned tuna contains up to 100x more zinc than deemed safe, negatively impacting the digestive tract and absorption of nutrients. However, the referenced scientific study actually made an error in its calculation results, meaning that reported zinc levels in tinned tuna were incorrect.

The Scientific Results: Miscalculated

The Experiment

The media cited a study by researchers at Binghamton University and the U.S. Department of Agriculture, which was published in the peer-reviewed Journal of Food and Function. The aim of the experiment was to investigate whether the zinc oxide in tin cans leaked into its preserved food, and its potential effect on digestion.\(^1\)

Researchers measured the zinc levels of samples taken from the following four canned foods (which are naturally low in zinc):

1. Asparagus
2. Chicken
3. Tuna
4. Sweet Corn

They then compared this number to the average zinc levels that would be consumed in a typical portion of asparagus, chicken, tuna, or sweet corn. Based on their numbers, the researchers investigated how these levels of zinc would affect digestions using a ‘cell line’ experiment (extracted from human colon).

The Results

Based on their measurements, the researchers miscalculated zinc levels to be an incredulous 996 mg in an average portion of tuna and asparagus. That is at least 100x higher than the recommended 6-13 mg daily intake.\(^2\)

The ‘cell line’ experiments suggested that this supposed high level of zinc could negatively affect digestion by reducing absorption of iron and glucose.

The Miscalculation
There was an error in the calculations of zinc levels of the preserved food's portion size and weight. The experiment measured 0.027 mg of zinc per gram of freeze dried tinned tuna.

This number should have then multiplied to the average freeze dried weight (47 g) of a typical portion of 112g tinned tuna. So, the actual calculation of zinc per portion is actually 1.27 mg—not the reported 996 mg.

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0.027 \text{ mg} = 0.000027 \text{ g} \\
0.000027 \text{ g} \times 47 \text{ g} = 0.001269 \text{ g} \\
0.001269 \text{ g} = 1.269 \text{ mg}
\]

For freeze dried asparagus, the concentration was 0.067 mg of zinc per gram. Multiplied by its dehydrated weight of 12.2 g, the zinc per portion is actually 0.81 mg.

Other Limitations

The conclusions from the 'cell line' experiment also used the miscalculated zinc levels, so any suggested impact of zinc on nutritional absorption of iron and glucose is also likely to be wrong. Furthermore, the 'cell line' experiment can't really directly tell us the effects of zinc on human digestion (a claim made by media headlines).

The researchers themselves even acknowledged in their Mail Online quote that 'It is difficult to say what the long-term effects of nanoparticle ingestion are on human health, especially based on results from a cell-culture model.'

The Bottom Line

Zinc levels in canned foods currently do not exceed the recommended daily intake and have not shown to pose a risk to our health. So, you can feel more at ease when eating canned food.
The following are the European standard recommendations for zinc intake:

- The European Food Standards Agency (EFSA) recommends the average dietary requirements for zinc to be between 6.2 to 10.2 mg/day for women with a reference weight of 58.5kg, and 7.5 to 12.7 mg/day for men with a reference weight of 68.1kg.²

- The UK Food Standard Agency 2006 UK Total Diet Study performed a risk assessment of dietary intake of food-supplements estimations (like zinc). The study found that estimated dietary intakes were below the maximum daily intake levels recommended by the Joint FAO/WHO Expert Committee on Food Additives. Based on these findings, the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment concluded that in the UK “current dietary exposures to zinc, excluding supplements, were unlikely to be of toxicological concern”.³

The Original Headlines

Mail Online (2018) Tinned tuna contains up to 100 times more zinc than is safe and could wreak havoc on people’s guts, study finds

Focus (2018) Il cibo in scatola potrebbe influire sull’assorbimento intestinale

Minute News (2018) Manger des aliments en conserve serait mauvais pour votre santé

Pour Qoui Docteur (2018) Les aliments en conserve sont riches en nanoparticules de zinc mauvaises pour la digestion

The Sun (2018) Tin-Digestion: This is why tinned tuna could be wreaking havoc on your digestive system

Women’s Health (2018) Tinned Tuna Found to Contain 100 Times the Recommended Daily Zinc Intake