

PESTICIDE

Dietary exposure to pesticides: transition from a conventional to an organic diet

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▪ Background:

Pesticides are a group of chemical compounds **widely used in the conventional agriculture to improve crop yields** due to the increasing demand of the population. Among all the different types of pesticides, **organophosphates (OPs) are the most used** in the agriculture. Several studies have reported that **OPs can be carcinogenic, cytotoxic, genotoxic, teratogenic and immunotoxic**. Therefore, an exposure to these compounds – even a low exposure – can lead to **severe health effects** to the human population. **In contrast** to conventional agriculture, **organic agriculture** is defined as the type of agriculture that **uses natural strategies and resources in a sustainable way**, such as, biofertilizers, biological pest control and crop rotation. Consequently, **organic produce consumer** would have a **lower dietary exposure to pesticides**.



On the other hand, **dialkyl phosphates (DAP)** are the most **widely used biomarkers to assess exposure** to these pesticides, as 2/3 of all OPs are metabolized into one of the **6 DAPs** that exist: dimethylphosphate (**DMP**), diethylphosphate (**DEP**), dimethylthiophosphate (**DMTP**), diethylthiophosphate (**DETP**), dimethyldithiophosphate (**DMDTP**) and diethyldithiophosphate (**DEDTP**). Moreover, due to their metabolism, **urine is the preferred matrix** to analyse these compounds.

▪ Goal:

To evaluate the dietary exposure to OP pesticides following a diet mainly consisting in organic products in comparison with a conventional diet

▪ Expected impact:

Find a **significant reduction** in the **urinary levels of OP pesticides** **after** following a **5-day organic diet**. Moreover, the **consumption of organic products will be encouraged**, highlighting, above all, this expected reduction of pesticides along with the **improvement of health**, as the potential adverse effects caused by exposure to these compounds will be reduced.

This study will serve as a base for future studies, which will focus on different diet styles (vegan, vegetarian, etc.) and will aim to derive recommendations for each specific dietary patterns.

