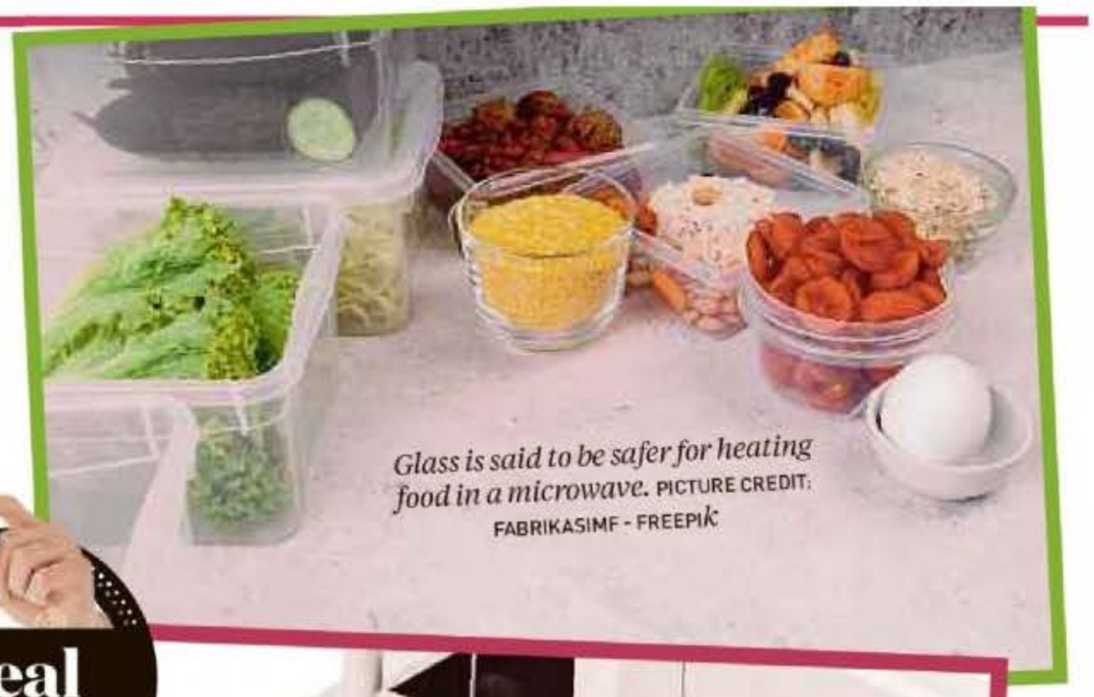
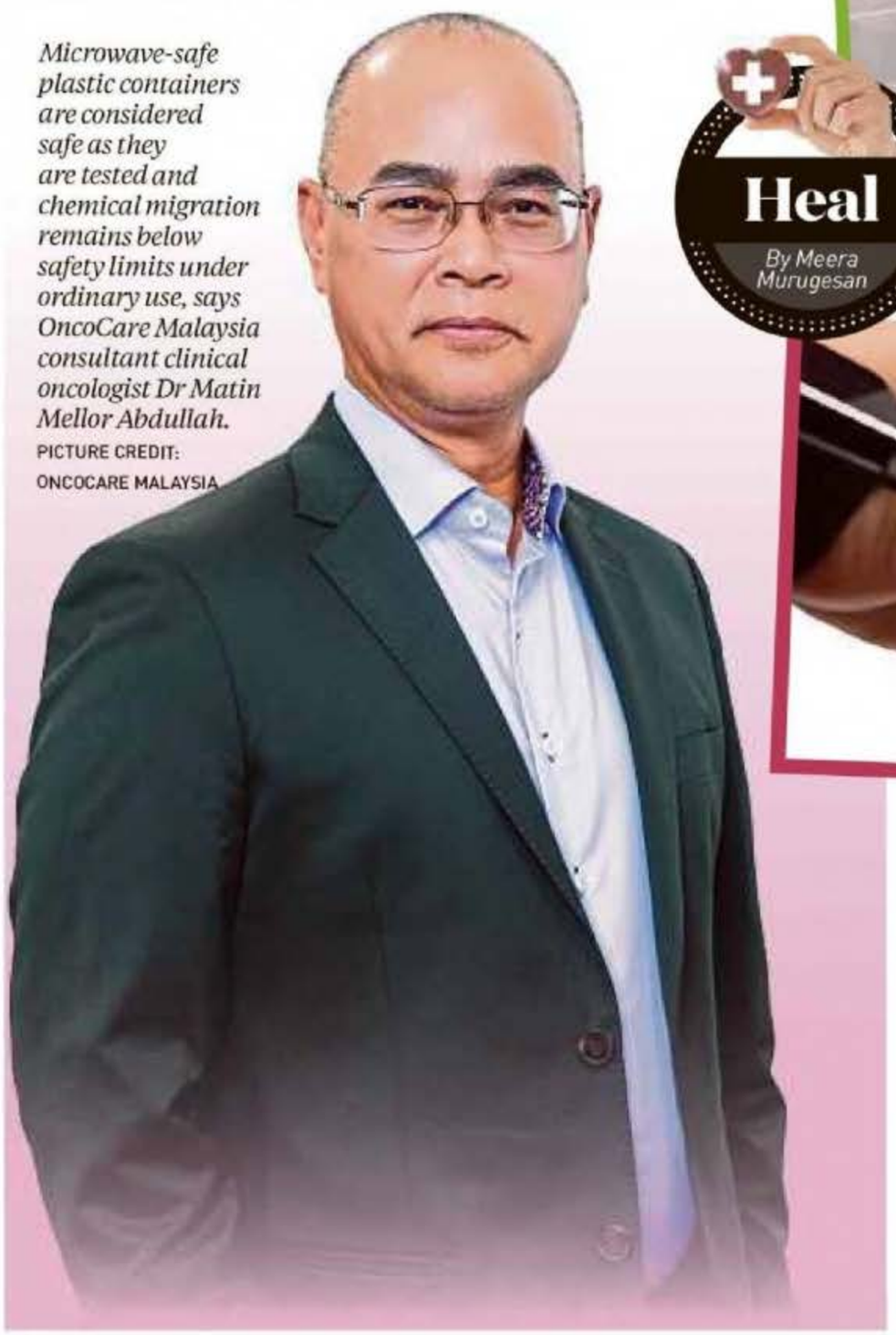
Are microwaveable plastic containers safe?



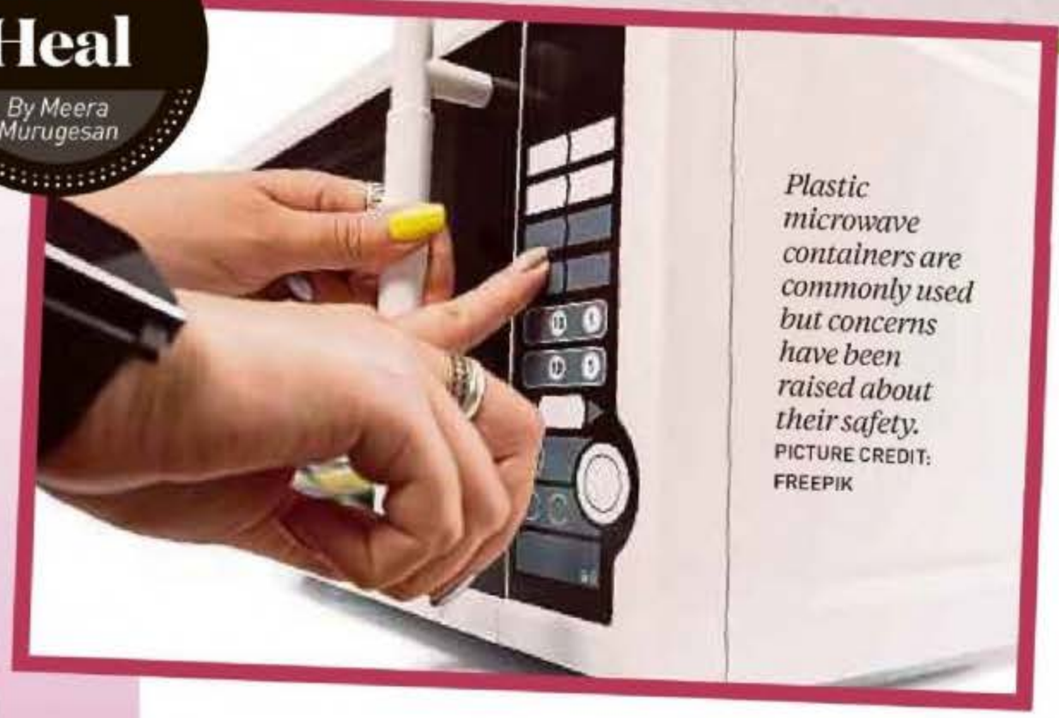
Glass is said to be safer for heating food in a microwave. PICTURE CREDIT: FABRIKASIMF - FREEPIK

Heal

By Meera Murugesan



Microwave-safe plastic containers are considered safe as they are tested and chemical migration remains below safety limits under ordinary use, says OncoCare Malaysia consultant clinical oncologist Dr Matin Mellor Abdullah.
PICTURE CREDIT: ONCOCARE MALAYSIA



Plastic microwave containers are commonly used but concerns have been raised about their safety.
PICTURE CREDIT: FREEPIK

MICROWAVEABLE plastic takeaway containers can be found everywhere, from restaurants to homes, to store and reheat food.

It's affordable, practical and convenient. But is it safe? According to a new Greenpeace International analysis of peer-reviewed science, it's a potential cancer risk.

The report, 'Are We Cooked? The Hidden Health Risks of Plastic-Packaged Ready Meals', reviewed 24 recent scientific studies and found that convenience food items marketed as "safe-to heat" are, in fact, potentially exposing millions of people to invisible contaminants every day. Using these plastic containers in the microwave is said to release hundreds of thousands of micro and nanoplastics in minutes, exposing unsuspecting consumers to microplastics and hazardous chemicals that should never be in or near our food.

According to the report, more than 4,200 hazardous chemicals are known to be used in or present in plastics. Some, like bisphenols, phthalates, PFAS (forever chemicals) and even toxic metals such as antimony, are linked to cancer, infertility, hormone disruption and metabolic disease.

DISTINGUISHING FACT FROM FICTION

While there is enough evidence indicating that heating food in plastic containers can cause the migration of numerous substances or chemicals, such as microplastic and nanoplastics into food, the amount relates to the duration of heating, heating temperature and the integrity of the plastic food containers, says OncoCare Malaysia consultant clinical oncologist Dr Matin Mellor Abdullah.

"Longer heating at higher temperatures with degraded plastic containers releases more substances into heated food. Microwave-safe containers are considered safe as they are tested and chemical migration remains below safety limits under ordinary use."

As for the link between these hazardous chemicals and human health, Dr Matin says it remains under investigation.

"While there have been reports of cancer developing in animals in experiments, there is currently no definitive evidence of a direct link to cancer in humans."

Dr Matin says while reheating in glass and ceramic containers is certainly safer, one does need to be practical too. Microwaveable plastic containers are light and easy to carry compared with glass.

FAST FACTS

GO FOR GLASS

FOR reheating, glass is considered safer. But make sure lids (if plastic) are removed before heating.

Glass is safer because:

- Glass is chemically inert
- It does not leach plastic additives
- It does not release microplastics
- It is stable at microwave temperatures
- Borosilicate glass is especially heat resistant

From a toxicology standpoint, glass and stainless steel are the lowest-risk materials for food contact

LEECHING OF PLASTIC INTO FOOD

Heating plastic does release microplastics and chemicals under certain conditions, says Dr Zalina Abu Zaid, the Department of Dietetics head at Universiti Putra Malaysia's Faculty of Medicine and Health Sciences.

For example, a study published in the journal 'Environmental Science and Technology' found that heating plastic containers in the microwave caused the highest release of microplastics and nanoplastics compared with other scenarios (such as storage of food), with up to millions of particles per cm after just a few minutes of heating.

Research published in 'ACS Food Science and Technology' also compared microwave and conventional heating and found that various substances, including chemicals like antimony and bisphenol A, can migrate from microwavable plastic food containers into food simulants.

"However, we still don't have long-term human outcome data directly linking reheating food in plastic to cancer. Therefore, while the exposure is real, the disease link is still being studied."

Risk factors for cancer are also multifactorial and include smoking, alcohol, obesity and genetics.

Zalina says compared with these, microplastic exposure from reheating food is likely a small, incremental exposure. It's not a dominant driver, she explains.

Furthermore established health agencies — the World Health Organisation, European Food Safety Authority and the United States Food and Drug Administration — have not concluded that heating plastic containers of food in the microwave causes cancer in humans.

"The concern is more about chronic cumulative exposure, not immediate toxicity," she stresses.

It would therefore be unreasonable to attribute microwaving in plastic containers to cancer, but it is reasonable to say that it adds to the overall chemical exposure burden, which may contribute to long-term risk.

She adds that as at 2024-2025, microplastics have been detected in human blood, lungs and placental tissue. Some lab studies show inflammatory effects and oxidative stress in cells, and chronic inflammation is a known contributor to cancer biology.

However there is no strong human epidemiological evidence directly linking dietary microplastic exposure to cancer incidence as of yet, she says.

"Ultimately, heating food in plastic can increase exposure to microplastics and additives, but it is unlikely to be a major independent cancer driver compared with obesity, alcohol, smoking, or a processed diet."

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FAST FACTS

BE SAFE

- Avoid frequent consumption of heavily packaged ready meals
- Transfer food from plastic into glass before reheating
- Replace scratched non-stick pans
- Avoid overheating empty non-stick cookware
- Don't microwave using old or damaged plastic

Heating food in plastic can increase exposure to microplastics and additives, but it is unlikely to be a major independent cancer driver, says UPM's Dr Zalina Abu Zaid.
PICTURE CREDIT:DR ZALINA ABU ZAID