

Pesticide Removal Technology for Refrigerators

A Chinese multinational company is looking for technologies and/or methods to remove pesticides from fruits and vegetables so users can eat them safely with minimum or no additional requirements after taking the food from the refrigerator.

Key Success Criteria:

Successful responses will:

- 1) A variety of pesticide residues commonly found in Chinese fruits and vegetables can be removed (preferably all four categories can be removed).
 - 2) High removal rate: 90 percent and above.
 - 3) Using this technology as part of the fridge cannot present any threat to humans, nor affect the nutrition or state of the food. The technology and its use will not affect the proper functioning of the refrigerator
 - 4) Low noise
 - 5) Feasible user scenario: learning how to use the technology as a function of the fridge is seamless; people don't need to be trained to do it.
 - a) Scenario 1 (ideal but complex): people put unwashed and untreated vegetables/fruits in the fridge drawer, and the technology will remove the pesticides so when user opens the drawer again, he/she can consume them without any other treatment.
 - b) Scenario 2 (acceptable and simpler): the user puts the vegetable/fruits in the fridge drawer, and the technology will affect the pesticides on it so later they can be washed off very quickly on the sink. This way, the user still needs to wash the items after taking them out of the refrigerator, but they will be 100% sure the pesticides are successfully removed from the surface of the food after a quick wash.
 - 6) Speed is not a priority, but removal speed should be less than 30 minutes ideally.
 - 7) Low water consumption: if water is required at all, it will be in a small amount. Undesired approaches include dipping the food in a water container within the fridge, or spraying large volumes of water.
 - 8) The whole pesticide removal (or detaching from fruit/vegetable surface) function must be carried out in a container with the size of a regular fruit/vegetable drawer. For that reason, the size of the component or module that enables the pesticide removal must take as less space as possible from the storage capacity of the drawer.
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- 9) Working environment for the module at low temperatures (inside of a refrigerator)

Background:

There is a growing concern in the Chinese population about food safety, and one of the key issues is the heavy use of pesticides in fruits and vegetables by food producers. Chinese consumers won't trust the control mechanisms in the value chain up to the supermarket shelves, so there is a demand of methods to detect and remove harmful substances on the food at home efficiently. There are some options to do this with specific appliances that require dipping the fruits/vegetables in water with chemical substances, and also with ultrasound technology. However, additional space is required to have an appliance like this, and the water consumption is too large. Our multinational partner company is looking for a way to solve this problem by integrating this function in the refrigerator, and if possible, reduce the water used to remove the pesticides.

We welcome responses from companies (large or small and medium enterprises), technical experts and academic or industrial researchers, inventors and venture capitalists.

Possible Approaches

Possible approaches could be based on

- Plasma, electrolysis of water, free radicals, ozone water, ultrasonic cleaning tank, alkaline ...). All these technologies have been used for this purpose, but not in a fridge yet. We are willing to try these options with a company that can integrate them as part of the fridge, only if the amount of water used in the process is small.

Approaches Not of Interest:

The following technologies or approaches are not of interest:

- Consumables and/or detergents.
- Solutions that require too much water consumption (such as covering the food with water completely)

Preferred Collaboration Type:

Our multinational partner company prefers to work with partners that have existing technologies or approaches that can be applied to this specific application. Collaboration can involve technology licensing, product sourcing, proof of concept leading to joint development agreements and assistance with scale-up to manufacturing. Preference will be given to technologies or approaches that currently have working prototypes that can undergo feasibility, validation or proof of concept over a 3-6 month period. Financial support for the proof of concept phase will be negotiated based on specific performance targets agreed between both parties. For selected collaborators our partner company may provide access to samples, test equipment and testing facilities. Technologies will need to satisfy manufacturability, material cost and ease of use assessments to progress from the concept stage.

How to Respond:

We are looking for concise non-confidential proposals, statements of expertise or other enquiries if your expertise fits our needs. Please note that only non-confidential information can be accepted. The proposal should also provide us with appropriate contact information in order to help us keep update with solution providers. For all responses please indicate your preferred collaboration approach (eg supply, joint development, research) and capabilities (eg research, concepts, prototype, small scale manufacture, large scale manufacture).

If you are interested, please respond to:

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