

# Pest free whole food and ingredients

The infestation of ingredients is a problem with potential to grow. There are restrictions on the methods available to kill the pests and the rising world temperatures could lead to the expansion of infested regions. So, food companies need solutions.

One progressive food company has tackled the problem directly by installing a unique non-toxic pest control system. Day Plus One is an innovative whole food company, which specialises in the packing of dried organic and natural own label food products for a range of international customers.

It has just invested in a controlled atmosphere room (CAR) that exterminates insects at all stages of development from food supplies.

This means that its customers can now enjoy two stages of quality control for their products – the stringent measures that were already in place at the company (BRC A rating), and the new system to eradicate risks of infestation.

In fact there are three stages because stage one is the inspection of the delivered bulk products. If there is any sign of infestation the consignment is rejected. The accepted product is then placed into the treatment room which will hold 20 pallets.

## High-tech airtight room

The high-tech airtight room is made in Holland by ECO2 system and it works by controlling the temperature atmosphere and the humidity in and around the ingredients. A temperature probe is placed into the most remote pack in the room and pallets are sheeted over to help speed up the concentration of heat and gas.

When the doors have been sealed a member of the Day Plus One team contacts the remote control room at the system's manufacturers in the Netherlands and the process begins. The temperature is brought up to 27°C to stimulate the pest's life cycle and then any oxygen is removed and replaced with nitrogen.

The process takes about five days. This could be reduced by taking the temperature to 36°C, but the one day saving could be offset by the risk to some of the products, such as dried fruit, that are prone to deteri-

oration at the higher temperature. It is possible to take the temperature up to 46°C for less delicate products like rice. For similar reasons of quality the relative humidity has to be controlled as well to prevent desiccation.

## Eliminate all eggs

The temperature/gas combination method kills any eggs that may be present in the product and it is completely non-toxic (except to the insects). The main target insect is the Indian Meal Moth (IMM) and because it can survive in very low oxygen it is necessary to ensure that the gas in the container drops to less than 1% oxygen content.

Adult moths can be killed at 2.2% oxygen but earlier stages of the life cycle need less oxygen. However if the oxygen level goes below 0.5% then the eggs go into a hibernation state and are not destroyed!

It is clearly a system that does not form any potentially harmful residues and is approved in organic production. So Day Plus One are using this system for the variety of products they pack for organic own label customers, but they are also applying it to conventional products as well.

"We pride ourselves on using the highest quality produce, so naturally we want to protect our products," Adrian Lauchlan, founder of Day Plus One, told International Food Hygiene.

He explained how last year the company instigated a determined programme to guarantee their infestation protection. It initiated a series of audits which highlighted drawbacks in the distribution network which it then went on to solve.

Dried ingredients are often held in chill storage (less than 8°C) to restrict insect life cycle and infestation, and it was possible that a haulier could collect a load on day one store in an ambient environment on day two and deliver on day three by which time an infestation could have developed and grown. Furthermore, it became apparent that some hauliers were storing the goods in their own ambient warehouse which could have a resident population of insects.

"On one audit, we found infested product which had been rejected in a transportation company's warehouse sitting next to 'good'

product and the insects were crawling from one pallet to the next, effectively destroying any preventative measures carried out by the original supplier," Adrian told us.

Another problem noted was transport companies picking up rejected product from one company and placing it on a truck which had 'good' products intended for delivery to another customer.

So, although pest control procedures can be applied post harvest and before shipping, management and control may not be rigorous enough, and further repeat infestation can take place during transportation.

"Once the process is completed the Dutch controllers tell us we can open the room and they issue us with a certificate of eradication," Adrian explained, "and we then pack and seal the product and retain control until our approved transport companies deliver to the customer.

"The de-infestation is a weekly cycle that suits our system. We load on a Tuesday, seal the room through to Sunday and unload on a Monday for packing to begin."

## Keeping ahead of the game

The whole system has been operational since March this year. Although the level of ingredients rejected at delivery with IMM infestation had remained as high as last year the level of IMM infested product that had been accepted and packed had fallen to zero over the same period.

"With climate change presenting the very real likelihood of increased challenges for the sector we wanted to make sure we were ahead of the game, so we have made a considerable investment in this revolutionary system."

Renée Elliott, founder of Planet Organic, is a major customer of Day Plus One and she opened the first organic supermarket over a decade ago. "Taking the lead on this issue and favouring environmentally friendly pest control that really works is an important step for Adrian and his team," Renée told International Food Hygiene.

"We offer thousands of organic products and quality is something our customers take for granted. Organic standards are stringent and I applaud Day Plus One for its innovative action at the same time as maintaining the organic ethos." ■