# The looming end for polystyrene

Anna Yallop

Virtually the day I started at Seafood Innovations Ltd I was (albeit politely) instructed by industry spokespeople to help solve the challenge the food industry has of finding effective polystyrene replacements. Essential requirements that the replacement had to have were:

- To be made from a more environmentally friendly material
- To have at least the same thermal properties as traditional polystyrene
- To be able to withstand impact, whilst still protecting the seafood product inside
- To have the potential to be stacked up to five high whilst carrying up to 20kg of product per box
- To be leak-proof
- To be comparably priced with polystyrene (but could be slightly more expensive if found to be a comparable product)
- To be at least industrially compostable
- To potentially be recyclable

For reasons including food safety, cost of transport and logistical requirements, traditional poly boxes are often not recycled. It seems to have generally been accepted that when it comes to chilled products, once a shipment of goods is received, what the receiver then does with the poly boxes is not the sender's problem – there was no expectation that the boxes would be returned to the supplier, to be used again or disposed of.

This is where things have started to change. It is increasingly expected that suppliers of product are held accountable for what happens to their packaging even once the product is delivered.

As a result, more producers are looking for ways to ensure no-longer-wanted materials are reduced (in the first instance), recycled, reused, composted or returned to base to be dealt with by the supplier. This "end-of-life" responsibility for product packaging is fast becoming the reality for companies and while it's not yet regulated in New Zealand, this is happening in some overseas markets.

This change in accountability is starting to make producers think differently about how

Anna Yallop

their products are packaged and in case it isn't obvious, it makes good commercial and branding sense for organisations to look for opportunities to use sustainable packaging options.

ZealaFoam has been developed by the Biopolymer Network Limited (BPN), a company established in 2005 as a result of collaboration between research organisations Scion, AgResearch and Plant & Food Research. The researchers wanted to develop an alternative to fossil fuel-derived polystyrene, a material increasingly under the spotlight as less than ideal.

Problems with traditional polystyrene include its inability to break down over (some say) up to hundreds of years, the damage done to animals that ingest it, the minimal quantity that is recycled, the pollution generated during its production and the use of a non-renewable raw material during its manufacture.

Bioplastics are plastics derived from renewable biomass sources which can include starches, vegetable fats, wood, cellulose and a wide range of other biological materials. They have the potential to have a much lower carbon footprint, are not derived from fossil fuels, can be industrially or home composted or broken down via anaerobic digestion and can incur lower energy costs to manufacture.

ZealaFoam is a bioplastic foam made from expanded polylactic acid (E-PLA) of which the PLA beads are plant-derived. BPN impregnates the beads with the green "blowing agent" CO2. Once finished with, ZealaFoam can be industrially composted or safely burnt.

SIL is funding a small project with BPN to finalise ZealaFoam trials in packaging companies that produce traditional polystyrene products.

ZealaFoam has been designed so that these manufacturers don't need to retrofit equipment on their moulding machines to make it.

So far it has proved to be comparable to polystyrene in terms of impact resistance and insulation performance. Further trials will continue in coming months to ensure that the bead size is appropriate, that the foamed boxes do not leak and that the weight is close to that of existing packaging.

Work also needs to be done to brand the ZealaFoam in ways that make it obvious to consumers and end-users that the product is a more sustainable material which can be disposed of in ways that don't negatively impact on the environment.

After all, it looks and feels exactly like traditional polystyrene and it would be a completely lost opportunity if companies don't get acknowledged for using a bio-based packaging material simply because users didn't realise it was one.

BPN is the first in the world to use expanded PLA to create sustainably-sourced insulated packaging, and the product has been globally patented.

ZealaFoam beads have been used by BPN to create a range of other products including bean bag fill, bee boxes, toys and safety helmets. The list of potential applications is only limited by what can be moulded, so if there are other opportunities the fishing sector can see to replace other commonly-used items with new E-PLA-based products, let me know: *anna.yallop@seafoodinnovations.co.nz*

*Anna Yallop is general manager of Seafood Innovations Ltd (SIL).*