BEST PRACTICE FOR THE MUSHROOM SUPPLY CHAIN

Even the most polished or targeted marketing campaign will not work if the mushrooms on the supermarket shelf look old, brown, and unappealing. The same applies through the whole supply chain; effort spent on growing, picking and packing the best possible mushrooms will be wasted if they are not well managed after.

As production costs continue to rise, increasing consumption is key to improving grower returns. Although the industry invests well in marketing, impact depends on mushrooms having high quality at retail and acceptable storage life. Ensuring mushrooms consistently meet consumer expectations will help to grow the whole category.

Many pre-harvest and postharvest factors can affect mushroom quality. While some have been reviewed, more detailed information is needed about the effects of postharvest handling and temperature management in Australian supply chains.

To address this knowledge gap, a new levy funded project has commenced that aims to improve quality of mushrooms at retail, develop more efficient management of supply chains, and reduce rejections of mushrooms at retail distribution centres (DC).

"We really want to take this project to the people directly involved," project leader Dr Jenny Ekman said.

"To get industry on board, the project team aims to monitor a range of Australian supply chains, then examine quality and shelf life. This will allow us to identify problematic areas, as well as ensure the proposed solutions are logistically possible and financially viable," Dr Ekman added.

No amount of marketing will sell more mushrooms if they don't look good at retail.

Information collated through existing literature and on the ground 'field work' (de-identified) will be summarised and combined to create a Mushroom Supply Chain Best Practice guide.

In developing the guide, the project seeks to answer three key questions.

1. What is causing quality issues and rejections by retailers?

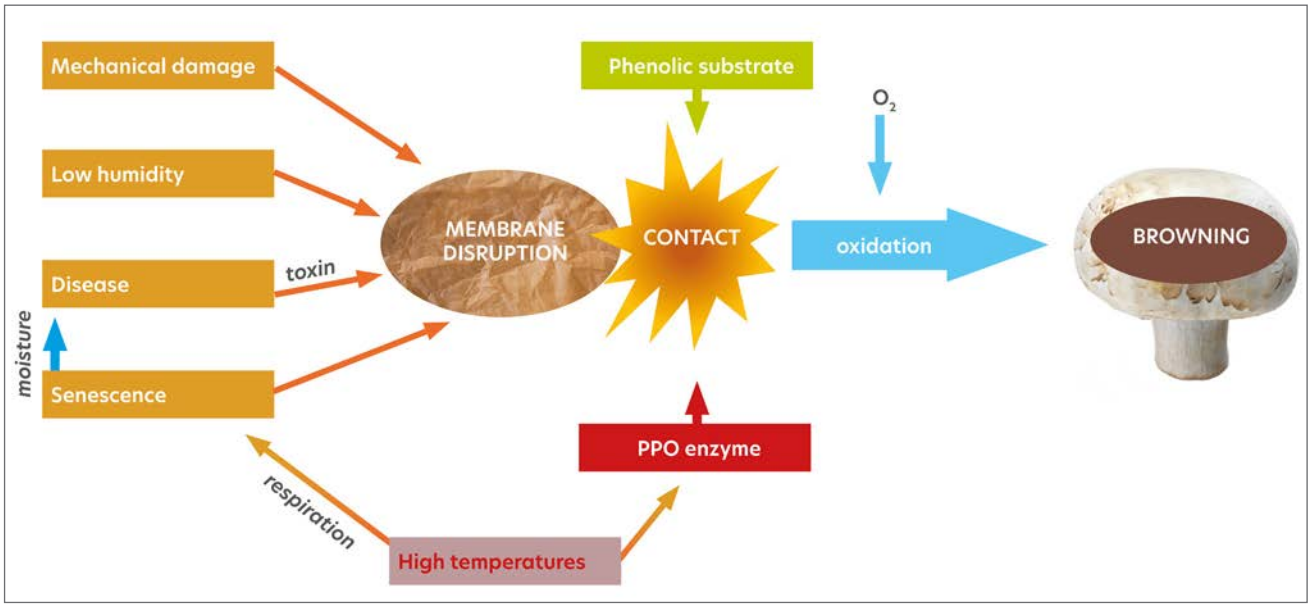
Identifying and managing the factors that impact mushroom freshness and colour at retail is clearly critical.

Key factors include cooling delays, storage and transport temperature, delivery delays and spatial temperature variability within a truck. Rejections could also be due to poorly calibrated probes or thermostats. These factors can all lead temperature related rejections at retail DC, which have little tolerance for consignments arriving above the recommended temperature.

While temperature fluctuations potentially increase food safety and quality risks for sliced mushrooms, the extent to which small changes in temperature impact whole mushrooms is less clear. "It really depends on whether the mushrooms get wet, and stay wet, as that is going to increase browning," suggests Dr Ekman.

Slicing makes it even more challenging to maintain mushroom quality and safety through the supply chain, but is increasingly popular with consumers.

Initial quality, freedom from pathogens, rapid cooling after harvest, and packing method are likely to have greater impact on quality than transitory temperature changes just before delivery.



Summary of potential causes of mushroom browning.

2. What happens after mushrooms arrive at the DC?

Temperature monitoring should not stop at the DC but continue through to retail. The conditions under which mushrooms are held during transport to stores, back of store handling and retail display are highly likely to have a significant impact on the consumer experience.

There is also some evidence that mixing mushrooms with ethylene producing crops, as can occur in trucks and back of store cool rooms, may reduce quality. "Ripening avocados, mangoes, passionfruit and stonefruit release significant amounts of ethylene," comments Dr Ekman, "but we just don't know what impact this may be having on mushrooms stored in the same environment".

Third flush mushrooms 9 days after harvest

Untreated

+ Calcium

Previous trials at the MLMRU have confirmed that adding $CaCl_2$ to irrigation water improves mushroom firmness and retains whiteness during storage, with the greatest effects on third flush mushrooms.

3. What is needed to improve quality at retail and reduce rejections?

The project team will use two strategies to address this question.

- **Innovate at critical control points**: Once we understand where issues are occurring, we will test solutions. These will be done in conjunction with industry partners to ensure they are consistent with commercial practice. They will also draw on past and present research, such as that currently conducted at the MLMRU.
- **Develop a best practice guide and training materials**: A concise, easy to understand best practice guide will be developed which is suitable for all supply chain participants, from grower to retailer. To encourage adoption, matching training materials and extension activities will be conducted to promote new information and resources.

The outcomes of this project will help industry improve the handling and storage of mushrooms within the value chain, from farm gate and transportation to retail.

"If we can manage the supply chain properly, we reduce rejections at distribution centres, improve retail quality, minimise waste, and ensure food safety," Dr Ekman said.

"That's a win for everyone"

KEY POINTS

- A new project aims to improve quality of mushrooms at retail by improving supply chain management
- Improved handling and storage will reduce rejection of mushrooms at distribution centres
- Industry engagement is planned into the project to ensure outcomes are both financially and commercially viable.
- Outcomes of the project will be summarised into a best practice guide for the industry

Hort Innovation Strategic levy investment | MUSHROOM FUND

This project has been funded by Hort Innovation using the mushroom research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au