



Project 4.2.3

Eliminating sulphur dioxide as a preventative enzymatic browning agent

Experts from Sheffield Hallam University have come up with innovative new methods of packing food for one of the UK's leading food producers.

The client, who produces over 140 million chilled ready meals a year for retailers, asked for help from Sheffield Hallam as part of the University's Food Innovation programme.

Researchers were asked to develop a method of storing peeled and diced

potatoes that would extend their storage life to at least 48 hours. The client originally utilised a sulphite dipping system to keep their potatoes free from browning, but the process went against new 'clean label' legislation and the EU's plans to reduce sulphite usage in food.

The team investigated two alternative approaches; vacuum packing and gas flushing, as well as looking at the effects of storage temperature. Storage of the products at ambient or

at chill (5°C) was also investigated as part of the study.

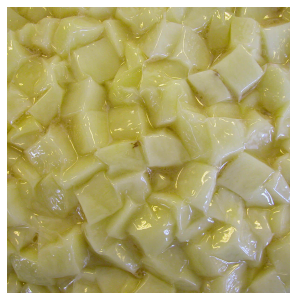
The test potatoes were packed immediately after peeling into nylon/polythene laminate pouches being air, nitrogen and water vapour tight. Measurement of oxygen and carbon dioxide levels in the packs was carried out at specific intervals up to 72 hours. Sugar levels in the potatoes were also measured.



Control potatoes



Gas flushed
after 48 hours



Vacuum packed
after 48 hours



The results

Both approaches to the problem produced the desired results, achieving up to a 72 hour storage time. The chilled stored potatoes generally had a higher glucose content which in some cases may be important as regards non-enzymatic browning in subsequent use (in this application the slight golden brown colour on cooking the potatoes added to their appearance as a pie topping). Microbiological assessment of the packs showed little or no growth and the best results were achieved with the chilled packs.

The research has also led to cost savings for the client who no longer purchases sulphite.

As a result, they are currently involved in full scale trials to test the new methods.

Future, potential applications

In any process where enzymatic browning is a problem (many cut and/or diced fruit and vegetables) and where sulphur dioxide is currently used to control the process, these two methods may offer an alternative.

There is a need to examine the pre-treatments, methods of gas flushing, the optimum storage temperatures and most suitable type of packaging - all of which can be investigated for other companies by Sheffield Hallam's Food Innovation programme.

The Food Innovation programme

This project is part of the University's £1.3m Food Innovation programme. Funded by the Higher Education Funding Council for England (HEFCE), the food innovation programme is designed to help companies respond to the business growth opportunities created by the healthy eating agenda.

For more information, contact:

David Johnson
Food Innovation Project Manager
Sheffield Hallam University

T: 0114 225 5000
E: d.johnson@shu.ac.uk

www.foodinnovation.org.uk
www.shu.ac.uk/foodinnovation