

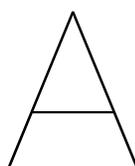


The Maltese Cheeselets Revolution: Enhancing Quality through Science

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I love Maltese cheese, from the fresh, soft tal-ilma to dried and peppered tal-bżar. Shredded on top of bread or pizza, melted into pasta sauces, or even as a snack, local cheeselets are simply wonderful. The only downside is their rather short shelf life, especially for the fresh variety. If only there were a way to make them last longer...





As any cheese-lover worth their rennet will tell you, there are several types of Maltese cheeselets with varying shelf lives.

The shelf life mostly depends on the drying process. For fresh cheeselets, where almost no drying occurs, their shelf life is limited to a few days at refrigeration temperatures. Those with a harder texture can be stored from weeks to months, depending on the degree of drying and the exact method used by the producer.

But what if there were a way to make these cheeselets last longer? By using edible films and coatings from biopolymers, the FunPack Project (Functional and Bioactive Packaging Solutions to Improve the Quality of Traditional Maltese Cheeselets), led by Dr Foteini Pavli (Lecturer at the Faculty of Health Sciences, UM) aims to enhance the quality and shelf life of cow milk cheeselets.

IS IT SAFE TO EAT?

Before we go any further, what are biopolymer films, and are they safe to eat? Yes, biopolymer films are edible, and many are specifically designed for use in food applications. 'Edible biopolymer films or coatings are typically made from natural materials such as proteins (such as whey and casein), polysaccharides (such as starch and alginates), and lipids (such

as waxes and oils),' explains Pavli. This is similar to the wax rinds you might find on a Gouda; however, biopolymer coating has also been used for other perishable products such as berries and strawberries.

While biopolymer films are safe for consumption, they don't have to be eaten. The films will have served their purpose by the time the product reaches the consumer. 'The film, depending on its specific characteristics and the intended application, protects the food from spoilage by delivering antimicrobial compounds and probiotic bacteria into the food,' explain the researchers. It is these probiotic bacteria and antimicrobial compounds that benefit and protect the cheeselet, in the case of the FunPack Project. The researchers will be assessing the impact of both of these as part of their study to identify whether the safety and also the quality of the cheeselets is enhanced and whether this application would have an effect on their taste and texture.

Not all bacteria are dangerous or cause harm. Probiotics are beneficial bacteria that, when consumed in adequate amounts, can confer a specific health benefit to the host. 'These are bacteria that are generally recognised as safe and are already present in certain types of foods. Certain yoghurts, fermented dairy products, fermented vegetables,

Top: Sephora Galea and Dr Foteini Pavli
Photo by James Moffett

Middle: Production of cheeses in the laboratory
Photos courtesy of Dr Foteini Pavli

Bottom: The developed films on cheese samples
Photos courtesy of Dr Foteini Pavli

and meats can all contain these microorganisms,' says Pavli. 'Antimicrobial compounds, on the other hand, are chemicals (natural and mostly plant-derived in the FunPack Project) which can inactivate microorganisms or inhibit their growth. It is these microorganisms which can spoil the food product or harm consumers.' The biopolymer films, probiotics, and antimicrobial compounds all come together to help create a safer and longer-lasting cheeselet. Sounds great! But will this affect the taste, texture, and all the things we love about cheeselets?

'The natural antimicrobial compounds we will be testing are mainly essential oils. Therefore, the cheeselet might have a slightly different appearance and characteristics. On the other hand, the addition of probiotic bacteria on the edible films/coatings might have an impact on the quality of the product, rendering it more acidic, while the texture and aroma will probably remain unaffected,' explains Pavli. However, this is where science comes in. The goal is to have the best of both worlds, and that can only be achieved through rigorous testing until the perfect balance is found.

TESTING THE CHEESELETS

'At the very beginning of the research, when we were making the polymer films,' the researcher explains, ➤





Microbiological evaluation of the cheeses after the addition of selected biopolymer films
Photo by James Moffett

‘we tested different coating methods to see how the film sticks to the cheese or whether it slips off.’ The researchers prepare the films, isolate them, and test them before applying them to the cheeselets. After that, they perform microbiological and chemical analyses of the cheeses and assess the changes that take place in the product.

At the time of writing this article, the researchers were working on incorporating antimicrobial compounds into the films. They explained how they have a list of essential oils and other compounds, which they would attempt to include in the films and coatings to examine their antimicrobial potential.

‘Once we start the experiment, lab days would start early, analysing both the cheeselets and the control cheeselet. [The former being cheeselets affected by films, while control cheeselets refer to cheeselets that have not undergone any special treatment]. We have cheeselets covered with just the edible biopolymers, biopolymers with antimicrobial compounds, biopolymers with probiotics, and cheeselets covered with a combination of antimicrobial compounds and

probiotics,’ the researcher explains. This allows the researchers to see the individual effect of each method and how the quality of the cheeselets is impacted. But how do the researchers check the quality of a cheeselet?

‘We perform chemical analyses related to the acidity, texture, and colour of the samples, while at the same time, we evaluate the microbiological status of each cheese,’ say the researchers. ‘What we care about most is whether the application of films contributes to the development of a product which is much different than the control cheese [cheese that we are all familiar with, and found on the market]. We want people to be unable to tell the difference as much as possible.’

TO LONG-LASTING CHEESELETS

Research in food science is mainly driven by a passion for improving public health and the need to ensure food safety. However, the researchers also want to address sustainability challenges and develop alternative technologies, ultimately contributing

to economic growth. The biopolymer films being developed with the FunPack Project serve as a more sustainable and environmentally friendly alternative to traditional plastic packaging. The edible films go beyond the scope of mere packaging by also enhancing food safety and possibly prolonging the shelf life of the product.

While we might be divided on whether peppered cheeselets are tastier than herb-crusts, or whether hard and semi-hard are superior to soft cheeses, we can all agree that a cheeselet with a longer shelf life can bring people around the world unbridled joy, because... age matters only if you're cheese! [T](#)

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The project is led by Dr Foteini Pavli from the Department of Food Sciences and Nutrition at the University of Malta. Sephora Galea is the Research Support Officer working on the project, while Malta Dairy Products Ltd. is a collaborator.