



Issue 15: March, 2015: This e-bulletin is aimed at personnel in fisheries & aquaculture, at fish packers, processors, distributors, retailers, health professionals and finally consumers.

Smoked mackerel fishcakes

Third year food science students in University College Dublin (UCD) undertake a 3-month product development module. It was initiated in 2003 and is currently coordinated by food scientist Mick O'Sullivan. The students are introduced to the concept of product development and work in teams of five to make actual products. Some of the products may be new or may be modified versions of products already on sale. Each group source their ingredients and produce prototypes leading to their final product. Each product is analysed and a series of physical and sensory tests are conducted to determine product characteristics and acceptability. The potential target market is considered as are the likely retail outlets and also the positive health aspects of the product. The module concludes with a 'products launch day' where each group present their findings and serve samples of their product for evaluation by their peers, post-graduate students and staff members. Marks are awarded and winners (1st, 2nd, 3rd) are decided but in reality every group is a 'winner'. The module exposes the students to the pros and cons of product development and prepares them for their six-month industry placement at the end of third year and for their likely career in the food industry. Products produced in September-November 2014 were granola yogurt, reduced fat mayonnaise, high protein cookies, vegi-crisps, speciality soft cheese, a high-tech smoothie, fruit drops (free of added sugar), low fat turkey sausages and smoked mackerel fishcakes.

Smoked mackerel fishcakes (Cistí Mara)

Fish cakes are a common item on menus even in expensive restaurants. They are also popular for home consumption and can be purchased in retailers usually as chilled short shelf-life products. Most fishcakes are made from white fish and usually have a bland flavour unless heavily spiced. The objectives of the current UCD study were threefold; (a) produce upmarket frozen fishcakes (Cistí Mara) using smoked mackerel (strong flavour) in combination with mashed potato and carrot thus combining the health properties of potato (complex carbohydrate), carrots (pro-vitamin A) and smoked mackerel (fish oil containing omega-3 fatty acids); (b) investigate the use of sodium caseinate as a cryoprotectant in frozen Cistí Mara via its ability to minimise freezing damage; (c) compare breaded Cistí Mara with cod/salmon fishcakes purchased in a supermarket.

Formulation and cooking of Cistí Mara

Peeled potatoes (300g) and carrots (300g) were boiled and mashed without milk or salt. The potato/carrot mash (500g) was mixed with minced de-boned smoked mackerel (500g) and 80g of sodium caseinate was added together with horseradish sauce (24g). Cistí Mara (each about 150g) were moulded, dusted with pre-dust, dipped in batter, coated with crumb and deep fried in oil until golden brown (190°C for 3.5min) followed by cooling, packaging (plastic bags) and deep freezing. Reheating for consumption was in an oven at about 180°C.

Testing and acceptability of Cistí Mara

The percentage composition of breaded deep fried Cistí Mara was moisture (56), carbohydrate (14), protein (18), oil (9.3), ash (2.3) and salt (1.38). The protein content of Cistí Mara was boosted by the inclusion of sodium caseinate. Approximately 7g of the oil content was from smoked mackerel and the remaining 2.3g was from the deep frying oil. Texture tests (Taxt2i texture instrument; courtesy of Teagasc) using a 20mm diameter perspex probe lowered 1cm into individual cakes at a speed 1mm/sec indicated that the inclusion of sodium caseinate greatly enhanced robustness and resilience (ability to remain intact) of previously frozen Cistí Mara compared to cakes without sodium caseinate. Centrifugal drip from thawed Cistí Mara containing sodium caseinate was 0.2% compared with 10% for cakes without thus indicating the efficacy of sodium caseinate in minimising freezing damage. Microbiological tests indicated very low bacterial counts and total absence of pathogens. Taste panel acceptability tests (21 tasters) indicated a preference for Cistí Mara (14 preferences) over cakes made with cod and salmon (7 preferences) which were purchased in a supermarket. Cistí Mara have a good nutritional profile (salt and frying oil are small negatives), are convenient and can be used as a starter or main course. Frozen Cistí Mara have a much longer shelf life than chilled which would result in logistic benefits in production, distribution & retailing.

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