SeaHealthUCD

Issue 11: May, 2014: This e-bulletin is aimed at personnel in fisheries & aquaculture, at fish packers, processors, distributors, retailers, and finally consumers.

Seafood Combination Products

Fish is usually sold on its own but fish in combination with other foods may represent considerable added value for processors and an attractive option for consumers. Such products can have a healthy image where the excellent nutritional properties of fish are combined with those of fruits, vegetables, salad crops, potatoes, pasta or high fibre brown breads just to mention a few. Examples of combination products include smoked salmon/brown bread, barbequed salmon/apple sauce, fish salads, and a range of fish ready-meals. These products can be attractively packaged in single, twin or triple compartmented packs ± modified atmosphere (to extend shelf life) and are usually retailed from chill cabinets (2-4^{o}C) or as frozen (-18^{o}C or colder). Three specific examples are as follows:

Salmon lasagne

This can be consumed as a main course ready-meal or as a starter depending on portion size and can be produced in gluten-containing or gluten-free forms (Braida and Gormley, 2008). The lasagne contained salmon sauce, Béchamel sauce, gluten-containing or gluten-free pasta sheets (Dr Schär, Italy) and mozzarella cheese. Gluten-containing or gluten-free Béchamel sauces were prepared by simmering a water suspension/solution of skim milk powder, wheat flour (or corn starch and corn flour for gluten-free option) and sunflower oil. Salmon sauce (50% salmon content) was prepared using diced salmon pieces in boiling water incorporating fish boullion, tomato puree, modified starch, stabiliser, cream, vegetable oil and a range of spices. Gluten-containing or gluten-free pasta sheets were cooked in boiling water (1.5-2min) and on cooling were layered with salmon sauce, topped with Béchamel sauce and then with mozzarella cheese. The lasagne was blast frozen (-35°C) and stored at -18^{o}C or colder until required (shelf life of months) or alternatively was chilled (2-4^{o}C; shelf life 6 days).

Ready-meal: potato, salmon, broccoli

Each component was prepared separately and the three were then combined in a ready-meal tray ± a modified atmosphere (O'Leary et al., 2000). Rooster is a suitable potato cultivar and mash (by boiling or steaming) was prepared using warm milk infused with onion to

give extra flavour. Salmon darnes were steamed (5-10min; depending on size) as were broccoli florets (3-4min). The three components were cooled (30min), portioned, packed and were suitable for retailing as chilled (2-4ºC; shelf life 6 days) or frozen (-18ºC or colder; shelf life months).

Sous vide seafood products

Sous vide (under vacuum) is a gentle heat process where raw product is vacuum packed in a plastic pouch and then heat treated using hot water or hot air followed by rapid cooling. The recommended minimum cook for ensuring safety of *sous vide* foods is a core temperature of 90ºC for 10min or time-temperature equivalent, e.g. if the product is cooked at 50-70ºC then much longer process times are required. *Sous vide* delivers high quality products due to the gentle cooking and the absence of oxygen in the pack (minimal oxidation). *Sous vide* has been used successfully for salmon and cod portions (Fagan & Gormley, 2004) and for a number of underutilised fish species (albacore tuna, orange roughy, cardinal fish, redfish, roundnose grenadier, blue ling, Greenland halibut) in a range of savoury sauces (tikka, Cajun, Toscana, Italian, tomato & basil, Rosemary & garlic) (Fagan & Gormley, 2005). These products were suitable for retailing as chilled (2-4ºC; shelf life 20-30 days) or frozen (-18ºC or colder; shelf life months).

Nutritional aspects

The components of the product examples above deliver a range of key nutrients including complex carbohydrate (pasta; mashed potato), protein (pasta; fish), omega-3 oils (salmon), taurine (fish), vitamin C (mashed potato; broccoli) and a range of minerals, vitamins and bio-actives that are desirable as part of the daily diet. For example, broccoli contains glucosinolates which are linked to cancer prevention, taurine benefits cardiovascular health, and other components of fish muscle help to reduce blood pressure. The Béchamel sauce used in the lasagne can act as a carrier for other health inclusions (nutraceuticals) such as prebiotics (feedstock for beneficial bacteria in the gut), dietary fibre and calcium obtained from seaweed (good availability in humans).

References

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