<table>
<thead>
<tr>
<th><strong>Title</strong></th>
<th>Ready-meals with a difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Authors(s)</strong></td>
<td>Braida, Marina; Gormley, T. R. (Thomas Ronan)</td>
</tr>
<tr>
<td><strong>Publication date</strong></td>
<td>2008</td>
</tr>
<tr>
<td><strong>Item record/more information</strong></td>
<td><a href="http://hdl.handle.net/10197/6947">http://hdl.handle.net/10197/6947</a></td>
</tr>
</tbody>
</table>

Downloaded 2020-09-11T19:49:24Z

The UCD community has made this article openly available. Please share how this access benefits you. Your story matters! (@ucd_oa)

Some rights reserved. For more information, please see the item record link above.
Ready-meals with

Ready-meals, both chilled and frozen, are well established in the international market report Marina Braid and Ronan Gormley of Ashtown Food Research Centre in Dublin

Intel data shows that the value of the frozen ready-meals market in the UK has been reduced by the effect of price promotion, while chilled ready-meals continue to be a big rival in the market place. This has caused the main players to diversify into premium and luxury range prepared meals. The developing market for food in central and Eastern Europe may also represent an opportunity for increased sales of these products.

Most ready-meals are made up of a combination of carbohydrate (eg rice, potato or pasta), protein (fish or meat), vegetables and sauce. Despite increasing awareness of the health benefits from eating fish, ready-meals containing fish are less common than those containing chicken or beef and the appearance of such fish meals on the market are a relatively recent occurrence.

**Phases of sous vide and freeze-chilling**
R&D on ready-meals has been a major focus at Ashtown Food Research Centre (AFRC) for a number of years. Much of the activity has been focused on freeze-chilling, which is a combination of freezing and chilling as the name suggests. This gives major logistical benefits for the processor as large amounts of a particular ready-meal can be produced, held in deep freeze, and then lots can be tempered and released into the chill chain as required, ie the consumer buys the meal as a chilled product.

R&D shows that freeze-chilling is a safe and suitable technology for most types of ready-meal and also for other products such as fresh fish fillets held in modified atmosphere packs (MAP).

Trials have also been conducted on fish processed by sous vide technology which ensures a gentle and low temperature process that causes minimal damage to the product in terms of nutritive value and sensory properties. A number of fish species in gourmet sauces have been processed at AFRC by sous vide technology with good outcomes.

Going beyond 'low fat'
We are in the era of 'healthy choices' and ready-meal companies are responding to this with meals containing reduced salt and calories. However, companies are only just beginning to realise the potential of ready-meals as carriers of functional (healthy) ingredients and nutraceuticals. Such meals have applications in all sectors of the community but especially to the elderly who may find meal preparation difficult and who may also be lacking in trace minerals and other nutrients and non-nutritives (eg dietary fibres). The production of such enriched meals is likely to be a major growth area in the near future especially when the inherent health benefits of fish are superimposed, ie these items become 'doubly' attractive.

These drivers led to the current study at AFRC on the formulation, preparation and freeze-chilling of gluten-free salmon lasagne containing nutraceuticals and also a sous vide processed ready-meal of the same formulation but with Rigati pasta instead of sheets (still gluten-free). The gluten-free aspect was introduced as intolerance to gluten and to wheat-containing products is becoming more widespread in Europe. For example, one in 60 people in Ireland is a diagnosed coeliac and it is suspected that a much higher number are undiagnosed, ie latent coeliacs.

The research was conducted in association with Irish ready-meal producer, Dawn Fresh Foods as part of the EU-funded Seafoodplus project.

For further information contact Ronan Gormley at ronan.gormley@teagasc.ie

---

**The Trial – Lasagne Formulation**

The gluten-free lasagne contained salmon slices (9% of which was salmon oil), gluten-free pasta sheets and marinated red chilli sauce. Two experimental groups were tested: (a) a gluten-free lasagne with gluten-free sheets, (b) a gluten-containing lasagne with gluten-containing sheets. The gluten-fat content of the lasagne was determined by sample analysis and was 1.5g/100g.

The nutraceutical targets were based on 400g of lasagne (for 146g of carbohydrate). These were: gluten-free pasta sheets (46g), reduced salt red chilli sauce (8g), smoked salmon (52g), gluten-free pasta sheets (46g), and marinated red chilli sauce (9g).

**Béchamel sauce**
Initially, the focus was on the Béchamel sauce component of the lasagne as this was used as the carrier for the nutraceuticals. Physiological and taste panel tests were conducted to study how the sauce properties were influenced by the gluten-free ingredients and by the nutraceutical inclusions. The gluten-free sauce was prepared by simmering over a constant heat source for a specified period and contained steamed milk powder, sugar, cheese, fromage frais, sunflower oil and water (this nutritional sauce contained 58% milk, 4% sunflower oil and water).

The gluten-free Béchamel sauce was less viscous than its wheat-containing counterpart as indicated by handheld viscometer readings (speed 20) of 3.5 vs 4.7 (p=0.012) respectively at 15°C. The Béchamel's texture was assessed using a 3-point hedonic scale ranging from 1 (unpleasant) to 3 (pleasant). The Béchamel was judged to be pleasant by the study panel.

**Effect of Inclusions**
A range of inclusions was added to the sauce, both individually and together (table 2). All of the inclusions (oxidatively) reduced orange colour except the prawns.
place and competition is strong both in terms of choice and price. But in this special show that there is more than one way to add value to these products

Salmon lasagne with nutraeuticals

Gruflins free pasta sheets were cooked in boiling water containing a small amount of salt for 4-6 minutes. The lasagne was formulated as described above and the cooked gluflins-free pasta sheets were mixed with salmon sauce (injection) then coated with nutraeuticals containing the nutraeuticals, which was then topped with cheese 

Sous vide salmon ready-heat with nutraeuticals

35g sous vide processed salmon paste with nutraeuticals was included in a composition to the Norwegian market. 

The finished product: salmon lasagne