Iodine cookbook: a recipe for improved iodine intakes in the UK

In the UK, iodine deficiency has been reported in several population groups, most notably in pregnant women, young women, and those who exclude certain food groups, e.g. vegans. A new iodine-rich recipe book was developed by three students at the University of Surrey, supervised by Sarah Bath and Margaret Rayman, to help improve iodine intake, with support from the EUthyroid project.

What process led to the creation of this cookbook?
With the aim of increasing the iodine intake in at-risk groups, particularly prior to, and during pregnancy, we decided to create a basic cookbook of iodine-rich recipes relevant to the UK situation. Our intention was reinforced by our participation in the Horizon 2020 EUthyroid project which aimed to improve iodine intake across Europe. We gathered data on the iodine concentration of foods from the UK foodtable database (1). Foods with an iodine concentration greater than 20 µg/100 g were defined as iodine-rich and were therefore suitable recipe ingredients.

However, clearly it is not just the iodine concentration of a food but the quantity of that food that is consumed that is important. Data from the UK National Diet and Nutrition Survey (NDNS) allowed us to identify foods that contributed more than 5% to total iodine intake. This resulted in a list of key ingredients for recipes: milk, milk products, fish/seafood and eggs.

We then searched the PubMed database to identify additional factors that affect iodine uptake or use by the body so that we could take these into account. These factors were selenium and iron – both essential for the production of thyroid hormones (2) – and foods with goitrogenic properties, i.e., foods that can reduce iodine uptake or utilization.

How did you go about creating the iodine-rich recipes?
Existing recipes were adapted and new recipes created to give 28 easy-to-make dishes that catered for a variety of dietary requirements. Each recipe was analyzed using Nutritics, the online nutrient-analysis software, to provide a nutritional breakdown of iodine, iron and selenium. Nutritional content per portion of recipes was rated against the European Food Safety Authority (EFSA) recommendations for adults and pregnant women. Recipes have symbols indicating their suitability for those following a gluten-free, vegetarian or vegan diet or their unsuitability for pregnant women. As the main sources of iodine are not suitable for vegans, an iodine-fortified milk-alternative drink has been used in some recipes to optimize iodine intake for individuals who exclude the key iodine source of cows’ milk.

How would you adapt the cookbook for other countries?
We already know from our EUthyroid research that the dietary factors that have the biggest contribution to iodine intake and status (as measured by urinary iodine concentration) vary between the UK, Spain and the Netherlands, the three countries from which we have data. Bread is an important iodine source in the Netherlands as iodized salt is used in its preparation. For Spain, fish is a very important source while for the UK, milk and dairy products are the major source. The UK has a higher concentration of iodine in milk, averaging 60 µg per 200 ml, than the other three countries. Countries such as Chile, China, Ecuador, Peru and New Zealand, where iodized salt is available to over 80% of households, could emphasize the use of adequately iodized salt in recipes as this can make a significant contribution to daily iodine intake. However, this strategy is not applicable to the UK as iodized salt is poorly available and only iodized to 11.5 mg/kg (3).

Joanne Tattersall and Declan Henderson worked on the development of the Iodine Cookbook in the course of their BSc final-year student projects. Mariana Dineva worked on the book as part of her PhD project on iodine.

References