MODELLING THE DIETARY IMPACT OF MANDATORY FORTIFICATION OF FOOD WITH FOLIC ACID

RL Sobolewski, JH Cunningham, TL Hambridge, J Boorman, B Joseph
Food Standards Australia New Zealand

Background
In May 2004, the Australian and New Zealand Food Regulation Ministerial Council asked Food Standards Australia New Zealand (FSANZ) to investigate the introduction of mandatory fortification of food with folic acid in Australia and New Zealand as a means of reducing the incidence of neural tube defects.

Why was dietary modelling conducted?
A dietary intake assessment was conducted to:
- assess the impact the introduction of mandatory fortification of food with folic acid in Australia and New Zealand would have on folic acid intakes in the target group, women of child-bearing age (16-44 years), and the general population; and
- to determine a level of fortification that maximised folic acid intake for the target group, while minimising the proportion of the target and non-target groups exceeding the upper level of intake for folic acid.

What food vehicles were considered?
Bread-making flour and bread were considered as potential vehicles for incorporating folic acid into foods. These were selected based on:
- international experience;
- technical feasibility;
- widespread consumption; and
- flexibility for industry.

Bread will be the vehicle discussed in this poster, as an example of the general modelling approach.

How was bread defined for dietary modelling purposes?
The definition for bread in the Food Standards Code was used to identify the foods that were included in the dietary modelling. The Food Standards Code states that bread is made from cereal flour, is yeast leavened and is baked. Therefore, the following products were included in the dietary modelling: all yeast containing plain white, white high fibre, wholemeal, grain and rye bread loaves and rolls that are baked; yeast-containing flat breads that are baked; focaccia; bagels; topped breads and rolls; English muffins; sweet buns; fruit breads and rolls; and bread crumbs.

What scenarios were used for assessing folic acid intakes from mandatory fortification of bread?
A number of bread fortification scenarios were examined:
- ‘Baseline’ to estimate current folic acid intakes from food alone based on the current uptake of voluntary folic acid permissions by industry;
- ‘Various Scenarios’ to estimate folic acid intakes from food alone based on the current uptake of voluntary folic acid permissions by industry (Baseline) plus the introduction of mandatory fortification of all bread at various concentrations, ranging from 100-170 ug folic per 100 g of bread.
- Additional calculations to determine folic acid intakes for women of child-bearing age who consumed folic acid from supplements in addition to food.

What were the key findings?
- Mandatory fortification of bread with folic acid is predicted to increase folic acid intakes for each population group assessed.
- Mandatory fortification of bread with 135 ug of folic acid per 100 g of bread maximised folic acid intakes in the target group, while minimising the proportion of the population exceeding the upper level of intake.
- The estimated mean dietary folic acid intakes for Australian and New Zealand women of child-bearing age are 95 ug and 58 ug a day at ‘Baseline’ respectively and 196 ug and 198 ug a day respectively after mandatory fortification of bread with 135 ug of folic acid per 100 g of bread.
- The mean folic acid intakes of the target group from food are still well below the recommended 400 ug of folic acid a day.
- Forty percent of the target group would receive the recommended 400 ug of folic acid a day when mandatory fortification of all bread occurs at 135 ug of folic acid per 100 g of bread and an additional 200 ug of folic acid is taken in supplement form.

Conclusion
Mandatory fortification of food can assist in increasing folic acid intakes in women of child-bearing age in conjunction with other strategies, such as voluntary fortification in a number of foods, consumer education and peri-conceptional supplement use.