

## PhD Project Advertisement

**Project title:** Variation in the iodine content of milk, dairy products, and eggs and the implication for UK iodine intake; studies at the farm, retail, and population level

**Project No:** FBS2022-12-Bath-sr

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**Project description:**

Iodine deficiency is common in some UK groups, such as in women of childbearing age. This is a public-health concern as even mild-to-moderate deficiency during pregnancy is associated with lower IQ in children. In the UK, and many countries, milk, dairy products, and eggs are the main dietary sources of iodine, together contributing over 40% of total iodine intake in UK adults, and up to 68% in children (National Diet & Nutrition Survey data, 2021).

We know that there is considerable variation in the iodine concentration in milk – for example iodine concentration varies by season, with lower iodine in summer milk. Components of cattle feed, for example white clover, may act as goitrogens and reduce the transfer of iodine into milk, although data are lacking to confirm this effect. While there is a known interaction between agricultural practice and the iodine content of milk, there are no data on its effects on the iodine content of other dairy products (e.g. yoghurt) or eggs.

Estimating the optimum iodine concentration of milk, dairy products, and eggs is key to ensuring adequate iodine intake in the population. This is especially true in the UK as there is no policy to fortify salt with iodine, unlike in many other countries where iodised salt is an important source of iodine.

This PhD project will therefore address these gaps in knowledge through three studies at the farm, retail, and population level (Figure 1). In addition, the student will also undertake a systematic review of the literature on milk-iodine concentration. The three main projects in the PhD are:

1. A farm-level study to measure the effect of clover on milk-iodine concentration by using stored samples from an animal trial (at AFBI); the student will measure the iodine concentration in milk and feed samples to understand the effect of white clover in cattle feed on milk-iodine concentration.
2. A retail-level study that will measure the iodine concentration in samples of yoghurt and eggs, collected from retail outlets throughout the year, in order to understand variation by farm-production system (e.g. organic) and season.
3. A study using population survey data (e.g. National Diet and Nutrition Survey) and dietary modelling techniques to evaluate the optimum iodine concentration of milk, yoghurt and eggs that would minimise the risk of iodine deficiency in the UK population.

The projects will allow the student to work with a multi-disciplinary scientific team who have expertise and experience in iodine research, animal science, analytical chemistry, and public health.

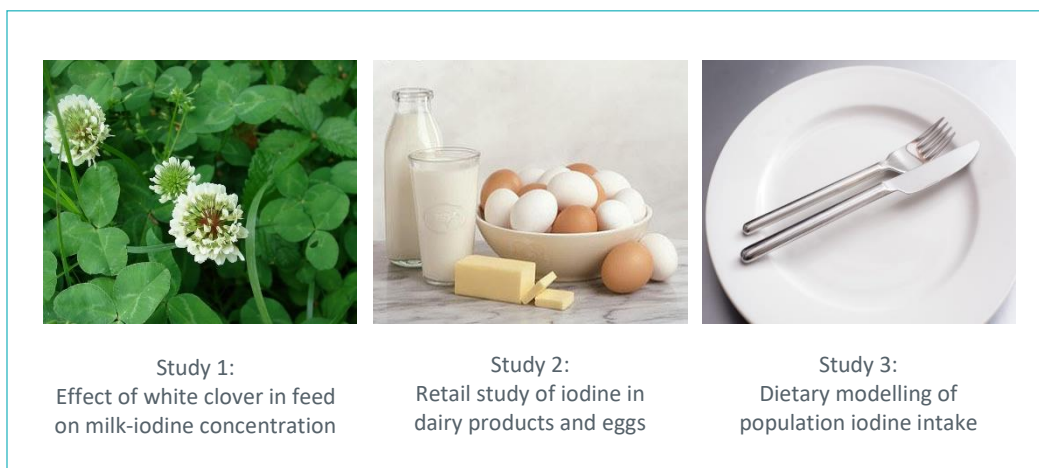


Figure 1: Overview of the main PhD projects

### Training opportunities:

The student will receive training in a wide range of skills, including laboratory analysis (of milk, yoghurt, and egg, as well as animal feed), data modelling, and statistical analysis. The student will spend 3 months at AFBI (in Northern Ireland) on an industry placement, where they will gain experience of animal trials and study management, and will develop their professional skills. The student will also spend time at the University of Reading, where they will analyse the iodine concentration of the study samples.

### Student profile:

The student should have an upper second-class level (or equivalent) BSc honours degree in nutrition, food science or a closely related subject. The student should have laboratory and statistical analysis skills, though training will also be provided. The student should have good attention to detail, a methodical approach, and good organisational and time-management skills.

### References:

- Bath SC, Button S, Rayman MP (2012) Iodine concentration of organic and conventional milk: implications for iodine intake. *Br J Nutr* 107, 935-940
- Qin N, Faludi G, Beauclercq S et al. (2021) Macromineral and trace element concentrations and their seasonal variation in milk from organic and conventional dairy herds. *Food chemistry* 359, 129865

### Funding particulars:

This project is supported by AFBI, who will provide an additional research funds to cover costs of the studies.

For up to date information on funding eligibility, studentship rates and part time registration, please visit the [FoodBioSystems website](#).