Qflex kit Folic Acid

BIACORE FOOD ANALYSIS

The increasing use of vitamin fortification to add value to food products has prompted manufacturers and food processors to seek more rapid and accurate methods for the quantitative determination of vitamins. Biacore™Q and Qflex™ kit Folic Acid (Fig 1) provide a validated method for reliable quantitation in food quality analysis. Biacore Q and Qflex kits facilitate the development of automated, label-free assays for reliable concentration analysis, offering significant savings in time and reducing the risk of experimental error.

Key benefits:

- Rapid determination
- Simple sample preparation
- Sensitive and precise assay
- Excellent correlation with conventional methods
- Same day results

Folic acid is a water soluble B vitamin, which is necessary for the production and maintenance of new cells. It is especially important during periods of rapid cell division and growth such as infancy and pregnancy. Therefore, it is commonly added as a supplement to various health and nutritional foodstuffs, such as cereals. Traditional methods for analyzing folic acid include microbiological assays (MBA), which require lengthy sample preparation and may need up to three days before results are obtained. This can limit the output of an entire processing facility.

Rapid determination using certified tests

Biacore Q and Qflex kit Folic Acid provide a rapid and reliable quantitation method, which has been certified as a Performance Tested Method[SM] by the AOAC Research Institute following independent evaluation and peer-review.

The Qflex kit has been specifically adapted to ensure a high sensitivity response to folic acid in different food matrices and significantly reduces analysis time compared to traditional

Fig 1. Qflex kit Folic Acid.

methods. It has been designed to provide the flexibility required during method development, together with the reliability essential for routine assays. All critical reagents are included in the kit.

Simple sample preparation

Sample preparation is simple and quick with no labeling or tagging required. Food samples and supplements are prepared using simple extraction procedures, minimizing pre-treatment time. The method can be used to analyze cereals, milk powder, milk-based infant formula, soya-based infant formula, fortified beverages, vitamin premixes and dietary supplements.

Sensitive and precise assay

Biacore Q and Qflex kit Folic Acid exploit the high affinity of a folic acid antibody to measure folic acid content in samples. The assay shows 100% cross-reactivity with folate derivative 5-methyl-tetrahydrofolic acid when samples are prepared in sodium ascorbate solution (Table 1). The assay is designed as an inhibition assay (Fig 2).

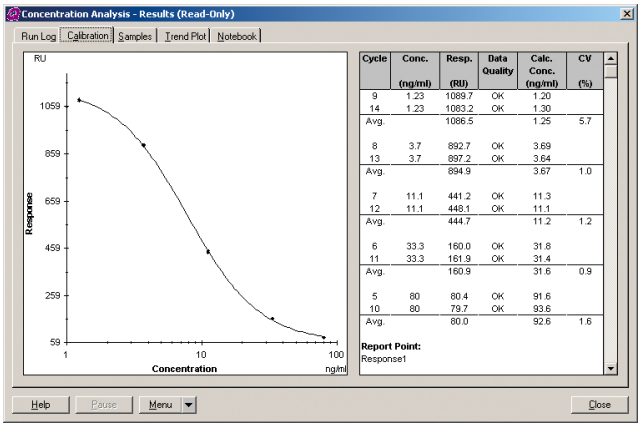

Fig 2. Folic acid calibration curve.

Table 1. Cross reactivity for the folic acid assay

Compound	% CR
Folic acid	100
5-methyl-tetrahydrofolic acid (in the presence of ascorbic acid)	100
Dihydrofolic acid	17
Tetrahydrofolic acid	8
Folinic acid (N`-formyl-5,6,7,8-tetrahydroxypteroyl glutamic acid)	0

Excellent correlation with conventional methods

Independent studies have demonstrated that analysis with Biacore Q and Qflex kit Folic Acid correlates well with the official microbiological method across a range of concentration values (Fig 3). Collaborative studies performed on a broad range of sample matrices have shown that the Qflex kit method also correlates well with other standard MBAs, with repeatability values in the range of 3%–5% CV and reproducibility values in the range of 5%–10% CV (Fig 4, Table 2).

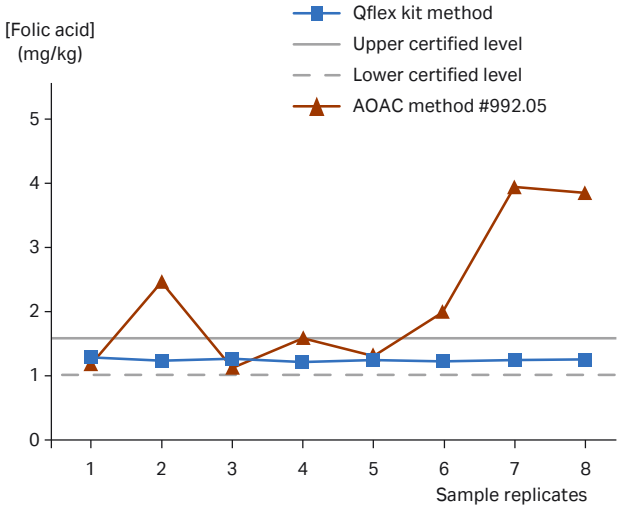

Fig 3. Independent comparison of Biacore Q/Qflex kit Folic Acid using sample preparation with AOAC method 992.05 for determining folic acid content in NIST SRM 1846.

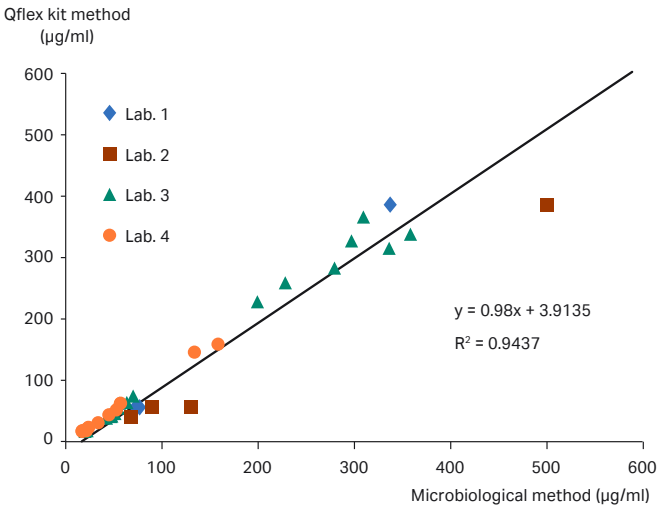

Fig 4. Correlation study of folic acid content in fortified food products, analyzed at four different laboratories.

Table 2. Determination of folic acid in different matrices using Qflex kit method and microbiological techniques (MBA). The results are given in µg/100 g except for premix results which is given in mg/100 g.

Food samples	Qflex kit method	MBA
Infant formula 1	59.8	60
Infant formula 2	317	320
Premix	13.7	14
Goat milk-based infant formula 1	89	85
Cereal	18	23
Whey-based infant formula 1	193	194
Whey-based infant formula 2	51	59
Milk-based infant formula NIST SRM1846*	119	128

*Range declared 129 ±28

Same day results

Performing an analysis is simple and straightforward. The system is fully automated from sample injection through to data analysis and report generation using wizard-driven software. Up to 86 samples, along with a calibration curve, can be analyzed in a single run, with results generated in real time. Results from a single sample can be obtained in less than 15 min and from 20 samples in less than 6 h (including sample preparation). Same day results enable food manufacturers to maintain closer control of the production process and allow earlier release of final product.

Kit contents

The kit contains folic acid antibody solution, folic acid calibration solution, Sensor Chip Folic Acid, regeneration solution, conditioning solution, HBS-EP buffer, microplates with adhesive foil cover, vials with penetrable septa, and instructions for use.

The sensor chip surface is preimmobilized with a folic acid derivative. The reagents supplied are sufficient for 4 × 20, 2 × 40, or 1 × 86 samples.

Technical specifications

Specificity	See Table 1
Cross-reactivity	See Table 1
Limit of detection	1.0 ng/ml
Quantitation range	2.0–70 ng/ml (corresponding to ≥ 2.0 ng/ml in liquid matrices and ≥ 4 µg/100 g in solid matrices)
Recovery	87%–96%

Approval

AOAC-RI Performance Tested Method 080201 — applies to cereals, milk powder, pre-mixes, milk based infant gruel, and soya-based infant gruels

Ordering information

Product	Code no.
Qflex kit Folic Acid	BR-1003-39

Related literature

Qflex kit Folic Acid Handbook	BR-1003-19

The handbook provides recommendations and instructions for analysis of folic acid in a variety of matrices and can be downloaded free-of-charge by users with a Product Key.

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