

Rapid Measurement of **Iron** in Corn Soy Blend (CSB) with iCheck





Corn Soy Blend (CSB)

Fortified blended foods have been used throughout the world as complementary foods for infants, providing energy, protein, vitamins, and minerals during critical child growth periods. For the past 50 years, fortified blended foods have also been used in food aid for children as well as pregnant and lactating mothers to meet their nutritional needs during seasonal lean periods and emergencies where under-nutrition may be prevalent.

One of the most common fortified blended foods is corn soy blend (CSB). CSB is prepared from a blend of maize and soya beans with added vitamins and minerals. Other ingredients may be added or substituted according to local tastes and customs. Milk powder, sugar, and oil are also commonly added to improve taste and caloric density. Similar products such as wheat soy blend (WSB) and rice soy blend (RSB) have been distributed where corn is not a commonly eaten food – here we will use CSB to encompass all of these types of blended flours.

The blended ingredients are heat treated during manufacturing and processing. The heat treatment improves the digestibility of starches and proteins for young children and reduces the cooking time required to prepare the CSB. CSB is generally made into a porridge, mixing with potable water and cooking for 5-10 minutes.

While not as effective as Ready-to-Use Therapeutic Foods (RUTF) and Ready-to-Use Supplementary Foods (RUSF) in treating or preventing cases of moderate acute malnutrition (where weight-for-height ratio is between 2-3 standard deviations from the average), CSB is much more cost-effective and has thus become a product widely distributed globally by many organizations, such as WFP, in their food assistance programs.



*School children in Malawi lining up for their serving of CSB porridge.
Photo: General Mills*

Providing a food for very young and acutely malnourished children comes with a stringent set of regulations to ensure safety and quality. Manufacturers and distributors along the value chain may want to measure the levels of various nutrients that have been added and iCheck can help make this process field-friendly, fast, and cost-effective.



How it works

Measuring **Iron** in CSB with iCheck

To facilitate the implementation of CSB, BioAnalyt developed a sample preparation protocol to enable reliable measurement of the concentrations of iron in CSB samples.

iCheck Iron is portable single-wavelength photometer, pre-calibrated for quantitative measurement of iron in multiple food matrices. iCheck Iron has the capability to measure intrinsic iron and added iron as ferrous fumarate, ferrous sulfate, NaFeEDTA, and ferric pyrophosphate in many food matrices.

To ensure reliable results with iCheck Iron, CSB samples require a customized sample preparation protocol*. Samples should be diluted in a hydrochloric acid solution to facilitate solubilization of the iron. Afterwards, the solution should be mixed to ensure homogenization and further incubated for 30 minutes in hydrochloric acid solution.

What Is Our Product?



Measurement Device

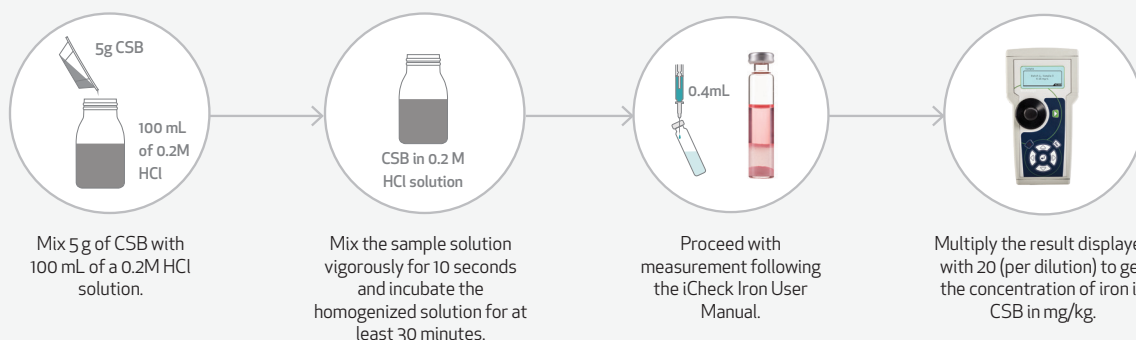
iCheck devices come in a case with all necessary accessories and have a 2-year warranty.



Consumables

Ready-to-use reagent vials come in a Test Kit box, containing consumables for 100 analyses, and have a 12-month shelf-life at room temperature.

HOW DOES IT WORK?



*Contact us to get **detailed protocol and training**:

Email: support@bioanalyt.com
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Results with **iChecks** are Comparable to those with **Reference** Methods

All iCheck devices are compared to traditional laboratory methodologies to ensure reliability and accuracy of measurements. For CSB, iCheck methods were compared to mass spectrometry methods (ICP-MS). CSB samples were sourced from Belgium and Rwanda and iron levels were measured using both methods.

The results are listed in the table below together with specifications provided by manufacturers. Based on these samples, iCheck results are comparable to those of ICP-MS and correlate well with the standard specifications.

Sample	Iron type	Specifications, mg/kg	Measured Concentration, mg/kg	
			ICP-MS	iCheck ± SD
CSB sample 1	Ferrous fumarate and NaFeEDTA	100	90.35	85.80 ± 2.80
CSB sample 2	Ferrous fumarate and NaFeEDTA	110	79.81	78.13 ± 2.50
WSB sample 1	Ferrous fumarate and NaFeEDTA	100	93.65	85.47 ± 0.64

iCheck analysis was performed in-house at BioAnalyt, Germany. ICP-MS analysis was performed in an accredited lab in Germany. Extended measurement uncertainty (MU) for iron with ICP-MS is 10%. ICP-MS method for iron was according to EN 15763 mod.; DIN EN ISO 17294-2. iCheck results are reported with standard deviation of triplicate measurement.

Benefits of iCheck



- **Speed:** Results in 5 to 60 minutes.
- **Economy:** Cost is only 10% of conventional lab methods.
- **Easy implementation:** Only 1 day of training is required.
- **Scalability:** Portable, with no set-up calibration required.
- **Accuracy:** Performance is comparable to reference lab methods.

iChecks are manufactured in Germany, used in over 80 countries and validated against standard laboratory methods. Learn more at www.bioanalyt.com/products.

