iCheck Fluoro

Measuring Vitamin A in Bouillon Cube

1. Method Principle and Application

iCheck Fluoro is a portable fluorometer for quantitative determination of the vitamin A content in vitamin premixes, bouillon cube, sugar, flour and milk. The method is based on the fluorescence of the retinol molecule (excitation at 340 nm, emission at ≥400 nm). The device algorithm calculates vitamin A concentration in µg retinol equivalents (RE) per liter (µg RE/L). The measurement range of iCheck Fluoro is 50 – 3000 µg RE/L.

2. Vitamin A in Bouillon Cube

The expected vitamin A concentration in bouillon cubes is generally 15 – 150 mg RE/kg. The most common form of vitamin A added to bouillon cubes is retinyl palmitate. Other esterified forms, such as retinyl acetate, are less frequently used.

3. iCheck Performance with Bouillon Cubes

The bouillon cubes powder was fortified (spiked) with known concentration of retinyl palmitate and the performance of iCheck Fluoro assessed. The table below summarizes the results:

Table 1. The Performance of iCheck Fluoro Device with vitamin A fortified bouillon cubes

Sample Type	Fortificant Type	Added vitamin A Concentration	iCheck Precision as RSD [1]	iCheck Recovery of added vitamin A
Bouillon cube	Retinyl Palmitate	15-150 mg/kg	±9%	101±11%

(1) RSD – relative standard deviation

4. Analyzing Bouillon Cube Containing Vitamin A

The measurement range of iCheck Fluoro is 50-3000 µg RE/L. The bouillon cube sample must be diluted in warm bottled or distilled water (~50 °C) to fit the measurement range.

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- Crush the bouillon cube into a fine powder using a laboratory mortar and pestle.
- Weigh the required amount of the crushed bouillon cubes as specified in Table 2 and record the exact weight.

Table 2. Dilution of Bouillon Cube for Vitamin A Quantification with iCheck Fluoro

Sample Type	Expected Vit.A Conc. [mg RE/kg]	Dilution	Sample Weight [g]	Volume of ~50°C Water [mL]	Expected Vit. A conc. In diluted Sample [µg RE/L]
Bouillon cube	15 - 49	1 : 20	5	100	750 – 2450
	50 - 150	1 : 100	2	200	500 – 1500

- Dilute the sample with warm distilled or bottled water (~ 50 °C).
- Record the total volume of your sample solution for dilution factor calculation.
- **Vitamin A is not stable in solution with water!** Proceed with measurement immediately.
- Vitamin A is not soluble but only dispersible in water. Therefore, if the diluted bouillon cube is standing still the vitamin A will separate from the water. Shake the solution and immediately take it up into the syringe.
- Inject 0.5 mL of the sample solution into a new iCheck Fluoro reagent vial. Shake the vial vigorously for 10 seconds. Proceed as described in the iCheck Fluoro User Manual.

5. Dilution Factor (DF) Calculation

The value displayed on iCheck Fluoro after measurement will reflect the concentration of vitamin A in the diluted sample. To obtain the original bouillon cube vitamin A concentration, you must first calculate the dilution factor according to the following formula:

$$DF = \frac{Total\ sample\ solution\ volume\ (mL)}{Sample\ weight\ (g)}$$

Once you have calculated the dilution factor, multiply the iCheck Fluoro result by the dilution factor.

$$Vitamin\ A\ in\ bouillon\ cubes\left(\frac{mg\ RE}{kg}\right) = iCheck\ Fluoro\ reading\ \left(\frac{\mu g\ RE}{L}\right) x \frac{DF}{1000}$$

For technical support email us: **support@bioanalyt.com**

Last Update: June 2025