



BioAnalyt

# Determination of vitamin A in extruded, fortified rice kernels

## by iCheck Fluoro

### 1.0 Sample preparation principle

The rice matrix is milled to a fineness of minimum  $\leq 125\mu\text{m}$  preferably  $\leq 53\mu\text{m}$ , dispersed in water and disintegrated by treatment with ultrasound.

### 2.0 Sample material

Extruded fortified rice kernels containing 2500 to 150'000  $\mu\text{g}$  retinol equivalent (RE) per 100g.

For conversion of  $\mu\text{g}$  RE to other units please refer to the following factors:

1  $\mu\text{g}$  RE = 1  $\mu\text{g}$  retinol

1  $\mu\text{g}$  retinol = 1.15  $\mu\text{g}$  retinyl acetate

1  $\mu\text{g}$  retinol = 1.83  $\mu\text{g}$  retinyl palmitate

1  $\mu\text{g}$  retinol = 3.33 IU

1 IU = 0.3  $\mu\text{g}$  RE

### 3.0 Apparatus and material

3.1 Grinder

3.2 iCheck Fluoro and reagent vials

3.3 Volumetric flask (closed) – if possible dark

3.4 Ultrasound

3.5 Vortex type of sample mixer

3.6 Paper tissues

### 4.0 Assay

#### 4.1 Sample preparation

Grind the fortified extruded rice kernels and sieve to receive a fraction with particle size of minimum  $\leq 125\mu\text{m}$ . Mix whole sample to ensure homogeneous particle size distribution and weigh 1 g of the ground rice into a flask and add water to reach 250ml. Avoid direct sunlight and use dark flasks if possible. Shake vigorously at ambient temperature for about 1–2 minutes until a homogeneous dispersion is visible. Avoid caking, lumping or sticking of the milled rice particles to the flask wall.

#### 4.2 Ultrasound treatment

Place the dispersion (sample slurry) into an ultrasound bath with hot water of  $75^\circ\text{C}$  and apply ultrasound for 20 minutes.



**DSM**

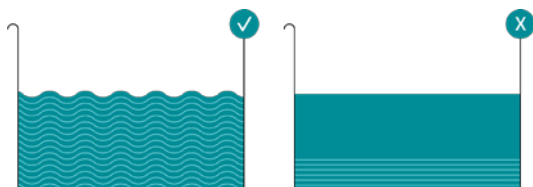
BRIGHT SCIENCE. BRIGHTER LIVING.

# Determination of vitamin A in extruded, fortified rice kernels

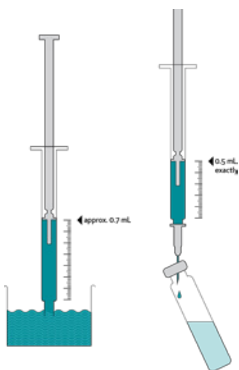
by iCheck Fluoro

## 4.3 Sample injection into iCheck Fluoro vial

Fill the dispersion into a beaker and stir constantly with a magnetic stirrer before taking 1 ml sample with a new syringe without a needle from iCheck Fluoro Test Kit while making sure it's still swirled and particles are not yet about to settle down.



Take up and remove sample dispersion into the syringe several times, in order to remove any air bubble in the syringe. If there are air bubbles in the syringe, quickly point the syringe up and gently tap on it to move the air bubbles up.



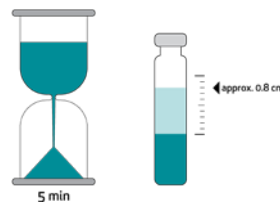
Place the needle on the syringe and move gently to make sure particles that might have settled again are well dispersed before adjusting the volume of the sample to exactly 0.5ml by ejecting excessive volume into a paper tissue. Make sure no air bubbles are left inside. Slowly inject 0.5ml of the sample dispersion into a new iCheck Fluoro extraction vial

through the red spectrum.

Vigorously shake the vial for 2 minutes in a Vortex type of mixer to enable the vitamin A to be extracted from the solvent. After shaking the content of the vial the sample should appear as uniform solution.



## 4.4 Extraction



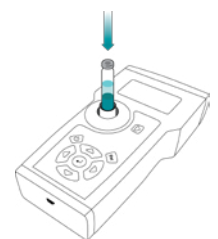
Now let the vial stand still for 5 minutes for the extraction of the vitamin A into the upper phase and adjust to ambient temperature. After waiting the solution in the vial should appear as two distinct

phases. Make sure a clear upper phase of approximately 0.8 cm is obtained.

## 4.5 Insert the vial into iCheck Fluoro

Control the glass surface of the vial. If the glass is not clean, wipe it with a paper tissue. Be sure to hold the iCheck Fluoro extraction vial only by its top to avoid finger prints in the area where the measurement is made. Insert the vial into the iCheck Fluoro and cover the vial with the metal cap.

Take care that no other objects, liquid or dust enters the measurement chamber. This would result in damaging the sensor and interfere with accurate measurement.



## 4.6 Start the measurement

Press the measurement key. This will initiate one of 4 measurements of your sample. Reposition the vial as indicated by the display.



## 4.7 Result display

When the sample measurements have been completed, iCheck Fluoro calculates the average over the four measurements. The mean result is displayed in  $\mu\text{g RE/l}$ .

*Notes:*

*Sample preparation procedure for fortified rice kernels has been developed by DSM Nutritional Products. The instructions starting from section 4.3 are taken from iCheck Fluoro User Manual.*

*Mixing by vortex for 2 min is specific for rice matrix and not part of standard procedure.*

If you have any questions, please contact us:

DSM Nutritional Products Ltd: [nutrition.improvement@dsm.com](mailto:nutrition.improvement@dsm.com) or visit [www.dsm.com/human-nutrition](http://www.dsm.com/human-nutrition).

BioAnalyt GmbH: [contact@bioanalyt.com](mailto:contact@bioanalyt.com) or visit [www.bioanalyt.com](http://www.bioanalyt.com).