

Vitamin E Analysis (Meat)

1. Application

This method covers the extraction and analysis of vitamin E from meat samples.

2. Summary of methods

3. Safety

Each chemical compound should be treated as a potential health hazard. The laboratory is responsible for maintaining a current awareness file of OSHA regulations regarding the safe handling of the chemicals specified in this method. A reference file of material handling data sheets should be made available to all personnel involved in the chemical analysis.

4. Interferences

5. Apparatus and Materials

- 5.1 Water bath (S/P Catalog #B7001-2, American Scientific Products, Manufactured by Lab-Line Inst. Inc. and MODEL # 182 Catalog #66643 Precision Scientific Group).
- 5.2 Glass test tubes with stoppers.
- 5.3 Analytical balance accurate to 0.1 g.
- 5.4 Multi-tube Vortex mixer, (GlasCol Multi-pulse vortexer, Cat. # 099A VB4) and variable speed single-tube Vortex mixer.
- 5.5 HPLC vials.
- 5.6 High Performance Liquid Chromatograph (HPLC).
- 5.7 Plastic pipettes.

6. Reagents

- 6.1 Saponification solution (Volume based on number of samples)

KOH	11% W/V
H ₂ O	45% V/V
ETOH	55% V/V
Vit. C	0.25 g/sample
- 6.2 Iso-octane (4 ml/sample)

7. Methods

Sample preparation and digestion

- 7.1 Add deionized water to rack level of water baths, cover and turn on baths. Adjust Temperature to 78°C.
- 7.2 Label test tubes
- 7.3 Weigh out 1.0 ± 0.1 gram of sample and record actual weight.
- 7.4 Add 7.3 ml of saponification solution. (See attached table for solution preparation.)
- 7.5 Vortex to mix samples.
- 7.6 Loosely stopper test tubes and heat in 78° C water bath for 7 minutes.
- 7.7 Vortex samples and heat again for 7 minutes.

Extraction

- 7.8 Vortex samples and cool in cold water.
- 7.9 Add 4.0 ml of iso-octane to each sample.
- 7.10 Securely stopper tubes and vortex for 2 minutes to extract vitamin E.
- 7.11 Allow tubes to sit to separate iso-octane from water.
- 7.12 Transfer iso-octane phase to an HPLC vial (avoid getting fat in this layer) and store at room temperature until samples can be run on HPLC. Samples are good for up to one week.

8. Calculations

$$V_E \text{ (ppm)} = \frac{\mu\text{g/ml in iso-octane} \times 4\text{ml}}{\text{grams of meat}}$$

9. Quality Control

10. Reporting

- 10.1 Results are reported as ppm of Vitamin E.

11. References

- 11.1 Qingping Liu, Kristine K. Scheller and Daniel M. Schaefer. Journal of Anim. Sci. 1996. 74:2406-2410