

# ISO 21468:2020 (E)

## Infant formula and adult nutritionals — Determination of free and total choline and free and total carnitine — Liquid chromatography tandem mass spectrometry (HPLC-MS/MS)

---

### Contents

	Foreword
1	Scope
2	Normative references
3	Terms and definitions
4	Principle
5	Reagents and materials
6	Preparation of solutions
6.1	Mobile phase A
6.2	Mobile phase B
6.3	HPLC injector wash
6.4	Preparation of choline and carnitine stock solutions
6.5	Preparation of working standard solutions
7	Apparatus
8	Procedure
8.1	Sample preparation
8.1.1	Samples needing reconstitution
8.1.2	Analysis of free carnitine and choline
8.1.3	Analysis of total carnitine and choline
8.2	Instrument parameters
8.2.1	HPLC parameters
8.2.2	LC-MS parameters
9	Calculations
10	Precision
10.1	General
10.2	Repeatability
10.3	Reproducibility
11	Test report
Annex A	(informative) Example chromatograms
Annex B	(informative) Precision data