

# Certificate of Quality

**Product appellation:** Long-term standards E1 – E4  
**Charge:** D00M05Y21

**Product description:**

Shock frozen raw milk (cow) without preservatives.  
 Samples are only for laboratory usage and not for human consumption!

**Application:**

The materials are suitable for checking accuracy of measurement results in raw milk analysis.

- Comparison in reference analysis, e. g. bench chemistry methods.
- Slope/Intercept calibration and adjustment of analytical instruments, e. g. infrared instruments.

**Reference values:**

Parameter	Method	Product appellation	Number of results	Reference value ± expanded uncertainty (k=2)	
<b>Protein (N x 6,38)</b>	Kjeldahl	<b>E1</b>	24	<b>3,08 ± 0,01</b>	<b>g/100 g</b>
		<b>E2</b>	27	<b>3,25 ± 0,02</b>	
		<b>E3</b>	24	<b>3,76 ± 0,02</b>	
		<b>E4</b>	27	<b>4,12 ± 0,02</b>	
<b>Lactose (monohydrate)</b>	Enzymology	<b>E1</b>	24	<b>4,42 ± 0,06</b>	<b>g/100 g</b>
		<b>E4</b>	24	<b>5,35 ± 0,06</b>	
<b>Dry Matter</b>	102 °C	<b>E1</b>	10	<b>12,52 ± 0,03</b>	<b>g/100 g</b>
		<b>E4</b>	8	<b>14,61 ± 0,08</b>	
<b>Freezing Point</b>	Cryoscopy	<b>E1</b>	40	<b>-0,476 ± 0,002</b>	<b>°C</b>
		<b>E2</b>	40	<b>-0,506 ± 0,002</b>	
		<b>E3</b>	40	<b>-0,524 ± 0,002</b>	
		<b>E4</b>	40	<b>-0,594 ± 0,002</b>	
<b>Casein</b>	Kjeldahl	<b>E1</b>	10	<b>2,43 ± 0,02</b>	<b>g/100 g</b>
		<b>E2</b>	10	<b>2,57 ± 0,02</b>	
		<b>E3</b>	8	<b>2,90 ± 0,03</b>	
		<b>E4</b>	10	<b>3,25 ± 0,04</b>	

Each parameter was analyzed in up to 9 different according to ISO/IEC 17025 accredited laboratories, each laboratory analyzing in manifold determination. The reference value is the arithmetic mean of all statistically checked measurement results. Accuracy of the reference value was ensured by comparison with the robust mean and IR-spectroscopic measurement.

The expanded uncertainty (k=2) was determined according to ISO Guide 35, taking into consideration the uncertainty between packaging units and the uncertainty of characterization. The uncertainty of stability is not included. Numerous stability tests have shown that the uncertainty of stability can be neglected for the calculation of extended uncertainty.

The metrological traceability is based on the above-named reference methods or the associated SI unit mass and temperature.

**Stability:**

Short-term stability under extreme transport conditions and long-term stability of the materials were checked with comparable materials. Stability was confirmed.

**The material is best used before:**

**2024-05**

Reference values and their uncertainties are guaranteed under the precondition that the material is stored, prepared and used as described below.

**Homogeneity:**

Homogeneity between packaging units was determined according to ISO Guide 35 on the basis of at least 10 samples taken stratified random from the whole batch. Homogeneity between packaging units is satisfactory.

Parameter	Product appellation	Range of dispersion (95 %)	
Protein (N x 6,38)	E1	0,001	g/100 g
	E2	0,007	
	E3	0,009	
	E4	0,007	
Lactose (monohydrate)	E1	0,009	g/100 g
	E4	0,005	
Dry Matter	E1	0,019	g/100 g
	E4	0,006	
Freezing Point	E1	0,0008	°C
	E2	0,0007	
	E3	0,0008	
	E4	0,0006	
Casein	E1	0,003	g/100 g
	E2	0,005	
	E3	0,006	
	E4	0,005	

**Packaging:**

Screw capped PP-plastic-bottles, at least 40 mL per bottle.

**Storage:**

Upon receipt of the delivery it must be checked if the samples are completely frozen. If this is the case, samples must be speedily unpacked. Samples must be stored in a suitable freezer immediately.

**Storage temperature:**

**≤ - 20 °C**

If samples are partial defrosted, use samples immediately or reject them.

If (partial) defrosted samples are frozen again or if storage temperature is not constantly ≤ - 20 °C (e. g. because warm materials were put into the freezer), samples may be damaged. An instruction on how to handle the samples after receipt is enclosed to each delivery.

**Preparation / Usage:**

The samples must be prepared and used according to the "Instruction for the usage of frozen long-term standards milk/whey". The instruction is enclosed to each delivery.

Manifold measurements and calculation of the mean lead to more reliable results.

**Notes:**

QSE GmbH guarantees the correctness of the contents only if the instruction of preparation and the use of the unchanged material are observed. The material is, in principle, a homogeneous material, on the basis of which no minimum removal rate is specified. The material is suitable for the usual analysis procedures in the dairy industry. On request, the product description and the safety data sheet are available for further information.

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