Application Short Note DUMATHERM

Nitrogen in oat milk / soya milk

Applied method (e.g. AOAC, DIN, EN, ISO, EPA, ASTM, §64, company sop, etc.)

DIN EN ISO 14891, Nitrogen Determination in milk and milk products, Combustion method according to Dumas, 2009.

Instruments

1	Analytical Balance (readability 0,1 mg or better)
2	Magnetic stirrer for homogenization
3	DUMATHERM N Pro, standard configuration

Gases and Consumables

1	Helium and Oxygen, bottle gas, min. quality grade 5.0	
2	Nitrogen or compressed air as bottle gas, min. quality grade 2.6.	
3	DumaReact, Combustion Reactor, packed with catalyst,	14-0245
4	DumaTube, Quartz glass for reactor,	14-0203
5	DumaFoil, Tin Foil for packing the samples,	14-0017
6	DumaSorb, Absorbent for liquid samples, 25g, 14-0022, alternatively DumaSorbeco, Absorbent for liquid samples, 50g,	14-0295
7	DumaEDTA, Standard for Calibration, purity > 99 %,	14-0032

Method Settings

Sample Weight	300 mg +/- 5 mg
Packing of the sample	tin foil
Combustion Method	C 1,2 (200 ml O_2 / min, 1.2 ml O_2 / mg sample
Protein Factor	6,25
Combustion Temperature [°C]	1030
Reduction temperature [°C]	750
Recommended Calibration Range	1 – 5 mg N absolute (measured with 5-50 mg EDTA, 10 points)

Homogenization / Preparation

The sample is stored closed in the fridge. For weighing the sample is taken out from the fridge, filled in a closed glass vessel and stirred in this vessel at room temperature on a magnetic stirring plate. The weighing is done with a disposable syringe directly into the tin foil. This foil has been prepared with approx. 100 mg DumaSorb and tared. The material should be max. at room temperature (≤ 20 °C) during the weighing procedure.

Example Results

Dumatherm Nitrogen / Protein Analyser

Serial Number : 859
Software Version: DUMATHERM MANAGER V6.17d
Submitter : sojadrink
Operator : Administrator

Date	Time	Sample name	Weight [mg]	Moisture [%]	Protein factor	Nitrogen Peak Area [mV*s]	N Weight [mg]	Nitrogen [%]	Protein [%]
18.07.2017	17:57:01	6095	308,903		6,25	4,106E+03	1,062	0,344	2,15
18.07.2017	18:02:03	6095	295,751		6,25	3,936E+03	1,018	0,344	2,15
18.07.2017	18:07:15	6095	321,673		6,25	4,182E+03	1,082	0,336	2,10
18.07.2017	18:12:21	6095	308,580		6,25	4,100E+03	1,061	0,344	2,15
18.07.2017	18:17:26	6095	305,949		6,25	4,067E+03	1,052	0,344	2,15
18.07.2017	18:22:30	6095	299,715		6,25	4,013E+03	1,038	0,346	2,16

Average	0,343	2,14
Standard Deviation	0,003	0,02
RSD [%]	0,993	0,99

Calibration number and standard name : for N EDTA (L-Q-Q) EDTA
Method : Beverage
Series Name : Siliker

Temperatures:

Combustion Reactor	979 °C
Reduction Reactor	799 °C
Degassing Oven	299 °C

Flow Rates:

He I	195,0 sccm
He II	200,0 sccm
O_2	199,0 sccm

Times:

Sample Delay	9 s
Sample Stop	13 s
Run Time	Auto

CALIBRATION: A standard calibration, performed with EDTA from 5 to 50 mg in 5 mg steps, is sufficient for this application. However, if the soya drink is measured together with other samples being higher in nitrogen content, another calibration up to higher EDTA weights can be used as well.
WEIGHT: the suggested 300 mg may can be reduced due to the homogeneity of the sample.
RESULTS: acc. to DIN ISO14891 standard deviations for liquid cow milk are allowed below 0,015% for nitrogen. The received sd of 0,003 for %N fits perfectly into that range. We compared to the ISO norm for milk, as now suitable method for soya milk (or similar) exists so far.

Remarks

It is important to homogenize the sample at room temperature before starting the weighing procedure.