

### Nitrogen & protein determination in dairy products

*KjelDigester K-449, KjelMaster K-375 with KjelSampler K-376:*

*Accelerated Nitrogen and Protein Determination in Dairy Products with Kjeldahl Tablets and Hydrogen Peroxide*

#### 1. Introduction

An easy and reliable method for the determination of total nitrogen and protein in dairy products using hydrogen peroxide, according to ISO 8968-3, is introduced below.

#### 2. Experiment

##### Sample:

- Skimmed milk with a labelled protein content of 3.2 g/100mL
- Cream with a labelled protein content of 2.5 g/100mL
- Lassi drink with a labelled protein content of 2.5 g/100mL
- Parmesan cheese with a labelled protein content of 33 g/100g

##### Equipment:

- KjelDigester K-449 (the parameters used are also valid for K-446)
- Scrubber K-415 TripleScrub<sup>ECO</sup>
- KjelMaster K-375 with KjelSampler K-376

##### Procedure:

First the sample is homogenized, then the sample is digested and after the digestion the sample is distilled and titrated.

Table 1. Distillation and titration parameters and settings with K-375 / K-376.

Parameters	Settings
Reaction time	5 s
Distillation time	180 s
Titration type	Boric acid
Sensor type	Potentiometric



#### 3. Results

Results of the determination of protein in different samples is shown in Table 2.

Table 2. Results of the determination of protein in different samples (n=3).

Sample	Labelled protein content [g/100ml]	Ø measured protein content [%]	RSD [%]
Skimmed milk	3.2	3.48	0.1
Cream	2.5	2.64	0.0
Lassi drink	2.5	2.38	0.7
Parmesan cheese	33	33.4	0.9

#### 4. Conclusion

The determination of nitrogen and protein in dairy products using the KjelDigester K-449 and KjelMaster system K-375 / K-376 provides reliable and reproducible results. These results correspond well to the labelled values of the dairy products and with the results of the standard Kjeldahl method Application Note 102/2013 with low relative standard deviations (RSD), but the digestion time is reduced to 60 min. For further information please download the full application note from the website.

#### 5. References

- Application Note No. 103/2013: Nitrogen & protein determination in dairy products
- ISO 8968-3 Milk-Determination of nitrogen content Part 3: Block-digestion method (Semi-micro rapid routine method)
- Kessler, H.-G.: Lebensmittel- und Bioverfahrenstechnik, Molkereitechnologie, Verlag A. Kessler, Freising, 4. Auflage 1996
- Kjeldahl Calculator App
- Application Note 102/2013, Nitrogen and Protein Determination in Dairy Products according to Kjeldahl Method
- Operation Manual of KjelDigester K-446 / K-449
- Operation Manual of Scrubber K-415
- Operation Manual of KjelMaster system K-375 / K376