

## Nitrogen & protein determination in milk powder

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

Accelerated Nitrogen and Protein Determination in Milk Powder with Kjeldahl Tablets and Hydrogen Peroxide

### 1. Introduction

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

### 2. Experiment

#### Sample:

Skimmed milk powder, whole milk powder

#### 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:

The samples are digested using the KjelDigester K-449. The distillation and boric acid titration are performed with the KjelMaster K-375 with KjelSampler K-376. The combination of the accelerated digestion method, using the Kjeldahl Tablet Titanium in combination with hydrogen peroxide, and the KjelMaster system K-375/K-376 increases the sample throughput.

Table 1. Distillation and titration with the KjelMaster system K-375 / K-376

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



### 3. Results

The results of the determination of protein contents in different milk powders are presented in Table 2.

Table 2. Results of the determination of protein in skimmed milk powder and whole milk powder (n=3).

Sample	Protein content [g/100g]	Ø determined protein content [%]	RSD [%]
Skimmed milk powder	32	31.8	0.4
Skimmed milk powder	32	32.3	0.2
Whole milk powder	25.2	25.6	0.4
Whole milk powder	25.2	26.31	0.4

### 4. Conclusion

The determination of nitrogen and protein in milk powder using the KjelDigester K-449 and Kjeldahl sampler system K-375/K-376 provides reliable and reproducible results. These results correspond well to the labelled values of the different milk powders and with the results of the standard Kjeldahl method Application Note 104/2013 with low relative standard deviations (RSD), but the digestion time is reduced to 60 min. Together with the fully automatic KjelMastersystemK-375/K-376, the time to result is significantly reduced and it offers fully walk-away convenience. For further information please download the full application note from the website.

### 5. References

- Application Note No. 105/2013: Nitrogen & protein determination in milk powder
- ISO 8968-3 Milk-Determination of nitrogen content Part 3: Block-digestion method
- Kessler, H.-G.: Lebensmittel- und Bioverfahrenstechnik, Molkereitechnologie, Verlag A. Kessler, Freising, 4. Auflage 1996
- KjelCalc App
- Application Note 104/2013, Nitrogen and Protein Determination in Milk Powder according to Kjeldahl Method
- Operation Manual of KjelDigester K-446/K-449
- Operation Manual of Scrubber K-415
- Operation Manual of KjelMastersystem K-375/K376