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UNIVERSAL ORGANIC MICRO ANALYSIS

ECS 80 SERIES

ECS 8060:

Application and examples

ECS 8060

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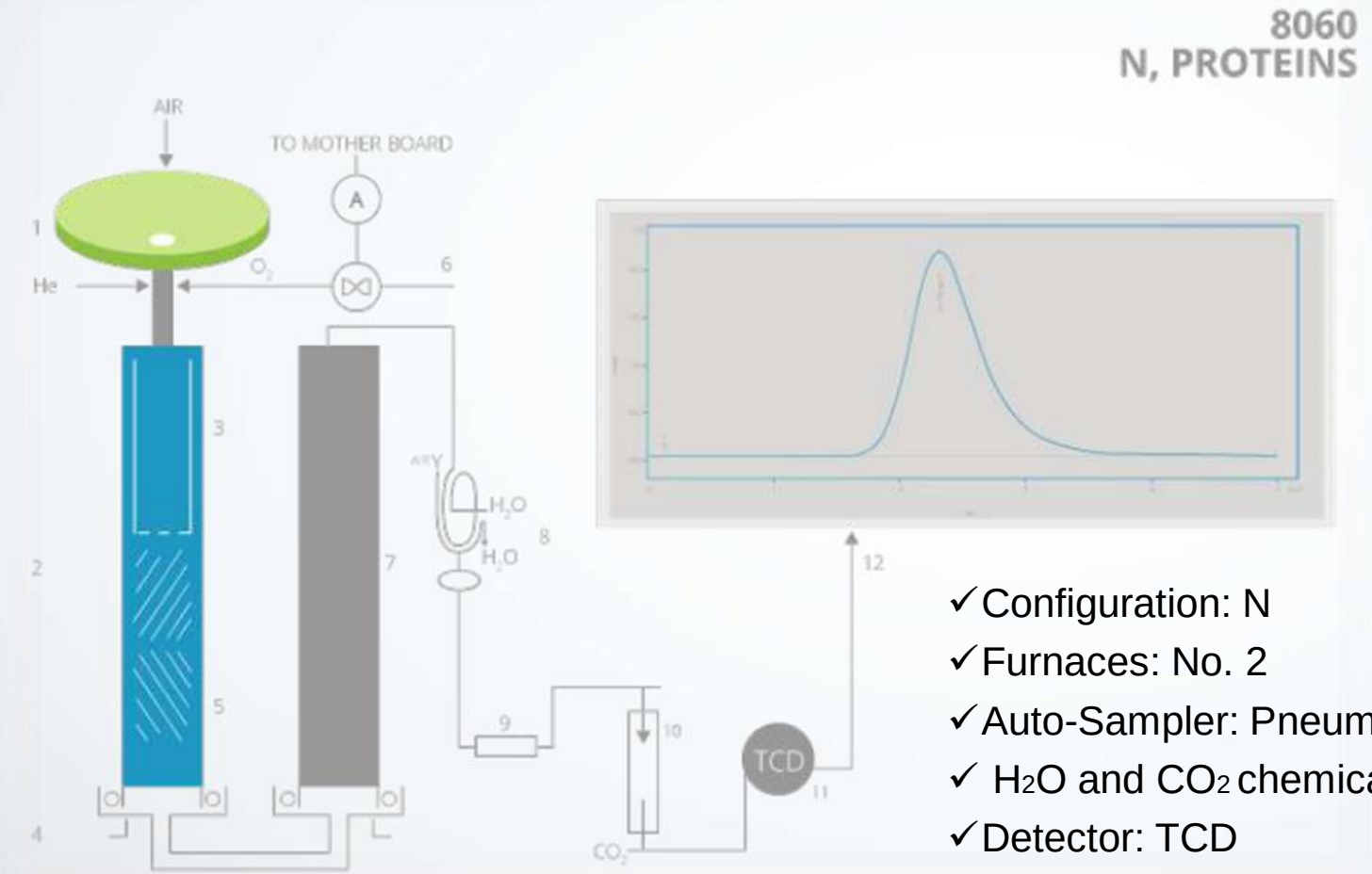
ECS 8060 – N configuration



- ✓Configuration: N
- ✓Furnaces: No. 2
- ✓Auto-Sampler: Pneumatic
- ✓ H_2O and CO_2 chemical traps
- ✓Detector: TCD

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ECS 8060 – Technical Features

Type	N – analysis;
Analysis Time	N – from 4 min up to 8 min;
Analytical Range	From 0,002 up to 20 mg;

Accuracy* <0,2% (certified standard; purity >99.9%)
Precision* <0,1% (certified standard; purity >99.9%)
Sample size: Up to 500 mg (depending on sample size and nature)
Sample type: Liquid and Solid

Pneumatic autosampler: up to 147 positions,
Electronic autosampler: 32, 50 100 positions,
Manual sampler

Dual Furnace System,
Safety Quick-fit Integrated,
H2O trap, CO2 trap,
Touch-screen display,
Stand-by mode

* Accuracy and precision are related to samples nature and homogeneity.

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ECS 8060 – Technical Features

Physical Specifications

Dimensions 110 x 56 x 37 cm,
Weight 90 kg,
Power Supply 230 V,
Absorbed Power 6A,

Gas Requirements:
Helium (99.999% purity), 3-5 bar or
Argon (99.999% purity), 3-5 bar

Oxygen (99.999% purity), 3-5 bar

Air (oil free compressed air)

ECS 8060 – Technical Features

Analytical Conditions

Gas carrier Helium or Argon,

Leak test Automatic leak test,

Furnace temperature Left furnace: 1100°C max
Right furnace: 1100°C max

Oxygen Automatically calculated by the oxygen doser,
Flow Rate Electronic control,

Water trap efficient and easy maintenance,

Detector High Sensitivity TCD,

Software data analysis EAS Clarity,

Calibrations: Linear, Quadratic, cubic

ECS 8060 – Main Application fields

✓Organic chemistry and pharmaceutical

✓Soil science and geology- marine science
(distinction between organic and inorganic carbon is available trough the previous acidification of the sample)

✓Environmental analysis

✓Petrol chemistry and energy

✓Materials characterization

✓Food
(Special configuration for big size sample is easily available)

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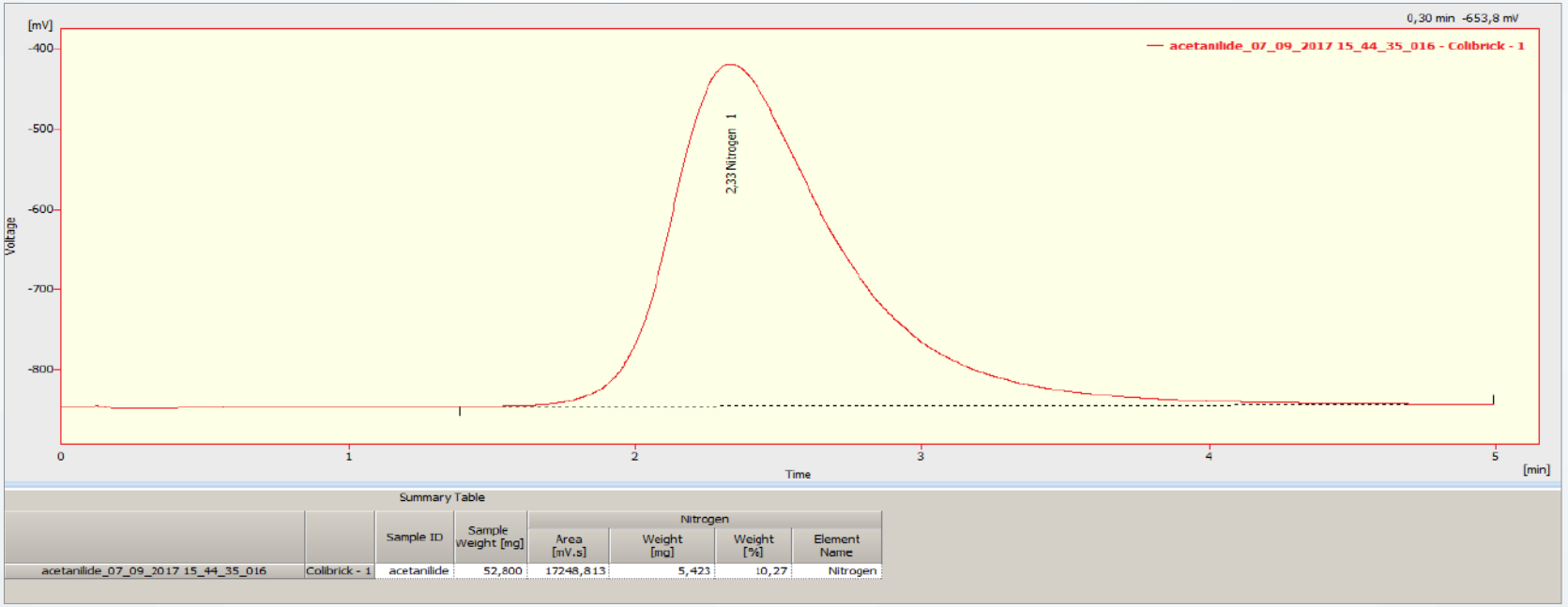
N in food and pet food

The protein content of food is normally determined based on its nitrogen content; this is multiplied by the coefficient 6.25, thus obtaining the crude protein.

In reality, part of the nitrogen of fodder and other foods is not protein in nature, deriving from free amino acids, amides, various organic compounds (nitrogenous bases), as well as from ammonia compounds.

By using ECS8060, nitrogen determination in pet food is easy and low-cost. Thanks to its versatility, both wet and dried samples can be analyzed, giving always high analysis performances and accuracy

ECS 8060 – N, proteins configuration –Typical chromatogram



Summary Table

		Sample ID	Sample Weight [mg]	Nitrogen Area [mV.s]	Nitrogen Weight [mg]	Nitrogen Weight [%]	Nitrogen Element Name
acetanilide_07_09_2017 15_44_35_016	Colibrick - 1	acetanilide	52,800	17248,813	5,423	10,27	Nitrogen

Standard: Acetalinide

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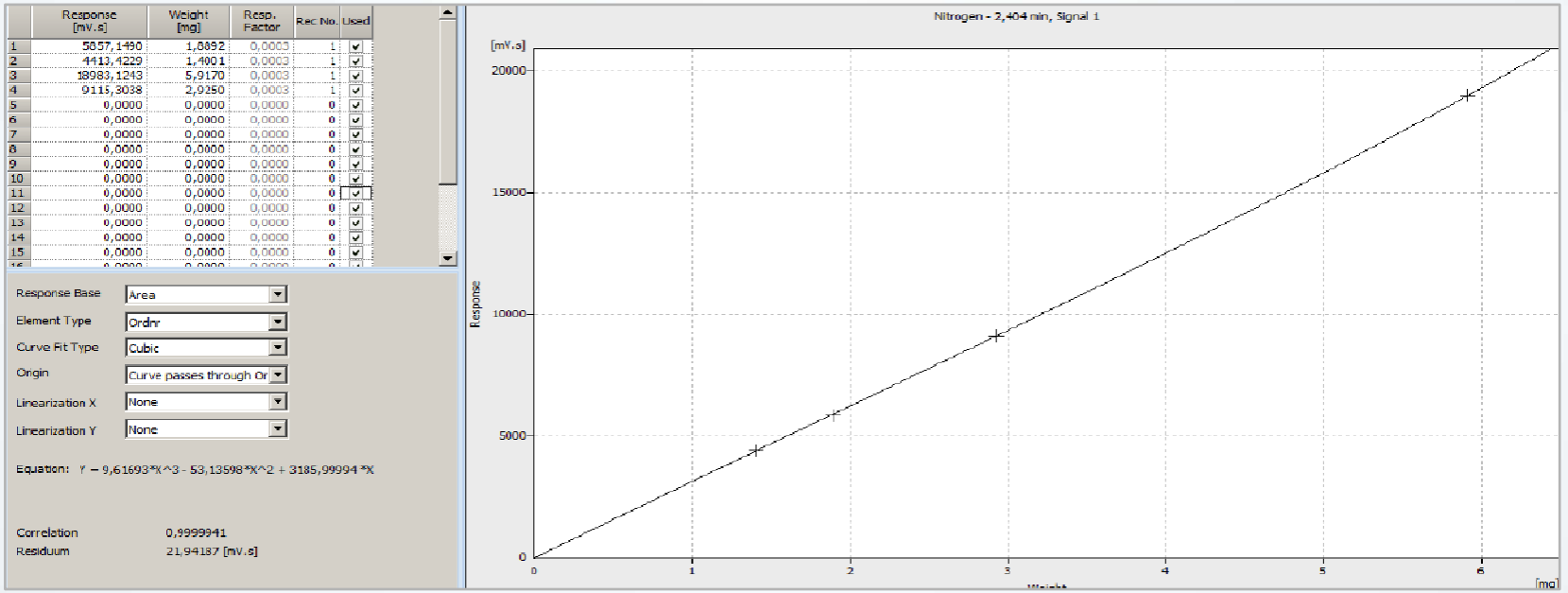
ECS 8060 – N, proteins configuration –Typical calibration curve



	Response [mV.s]	Weight [mg]	Resp. Factor	Rec No.	Used
1	5857,1490	1,8892	0,0003	1	☑
2	4412,4229	1,4901	0,0003	1	☑
3	18983,1243	5,9170	0,0003	1	☑
4	9115,3038	2,9250	0,0003	1	☑
5	0,0000	0,0000	0,0000	0	☑
6	0,0000	0,0000	0,0000	0	☑
7	0,0000	0,0000	0,0000	0	☑
8	0,0000	0,0000	0,0000	0	☑
9	0,0000	0,0000	0,0000	0	☑
10	0,0000	0,0000	0,0000	0	☑
11	0,0000	0,0000	0,0000	0	☑
12	0,0000	0,0000	0,0000	0	☑
13	0,0000	0,0000	0,0000	0	☑
14	0,0000	0,0000	0,0000	0	☑
15	0,0000	0,0000	0,0000	0	☑

Response Base: Area
Element Type: Ordnr
Curve Fit Type: Cubic
Origin: Curve passes through Or
Linearization X: None
Linearization Y: None

Equation: Y = 9,61693*X^3 - 53,13598*X^2 + 3185,99994*X

Correlation 0,9999941
Residuum 21,94187 [mV.s]

Calibration curve for N; range 1mg to 6mg
Standard: Acetanilide

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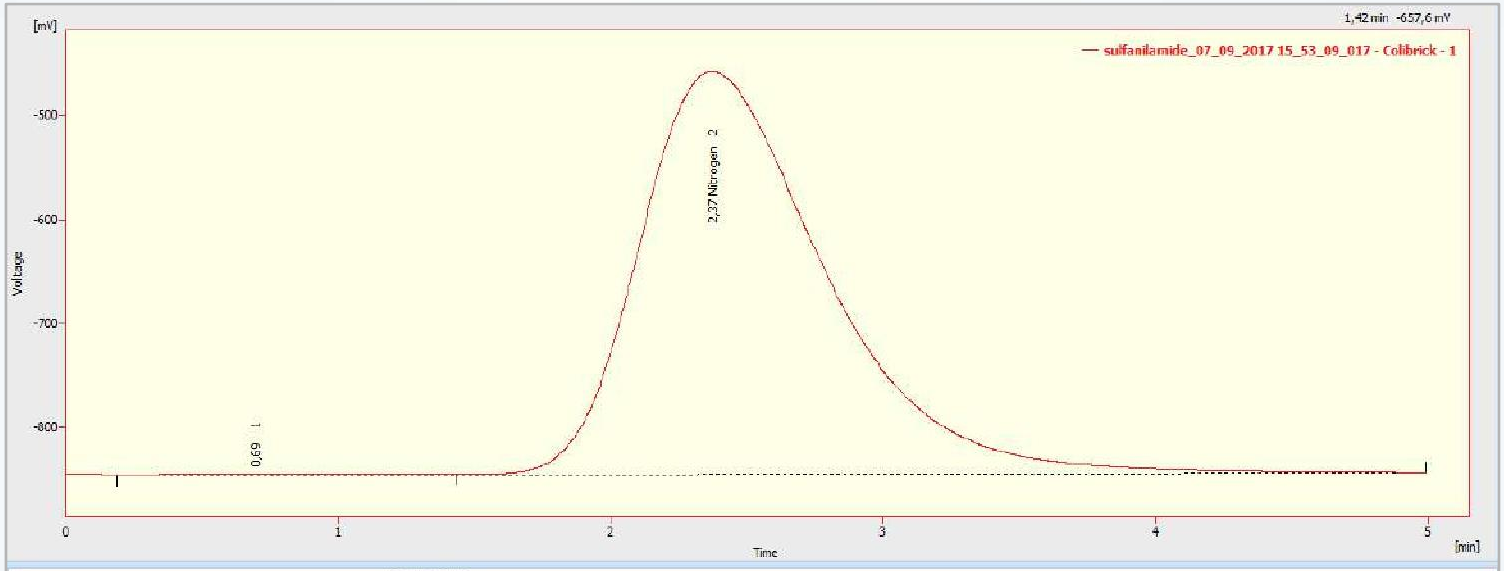
ECS 8060 – Standard example –Sulfanilamide



Summary Table

		Sample ID	Sample Weight [mg]	Nitrogen			
				Area [mV.s]	Weight [mg]	Weight [%]	Element Name
sulfanilamide_07_09_2017 15_53_09_017	Colibrick - 1	sulfanilamide	35,700	18345,178	5,737	16,07	Nitrogen

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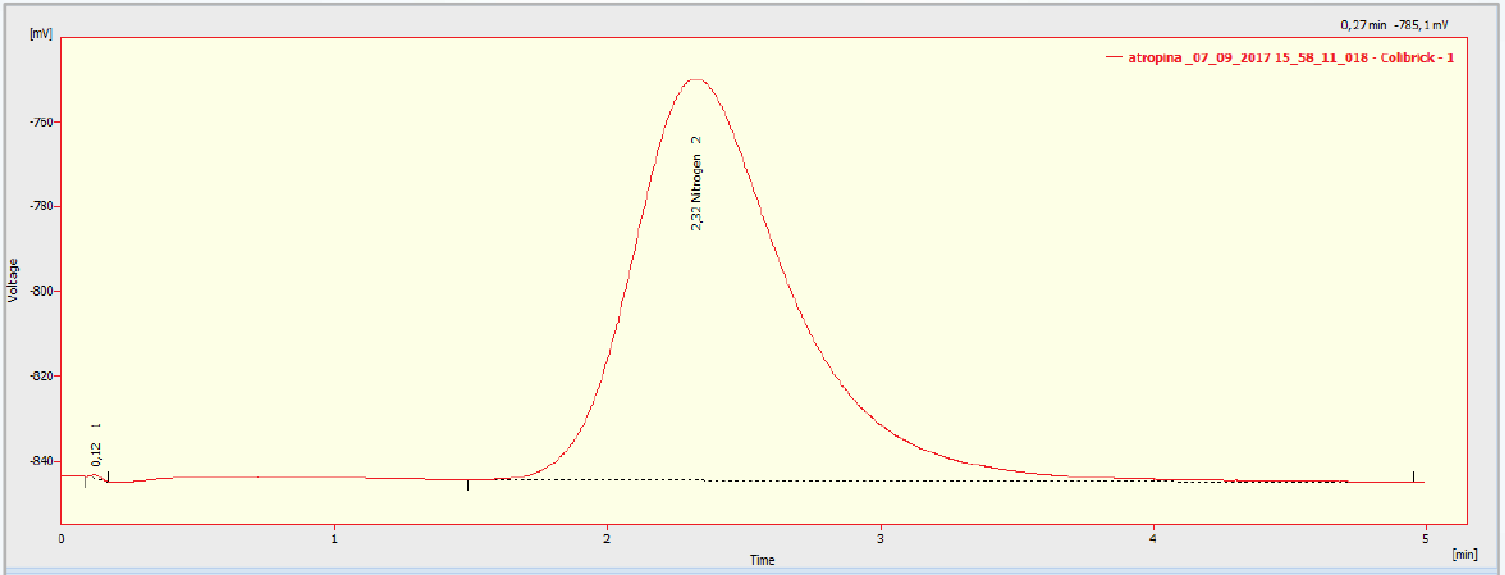
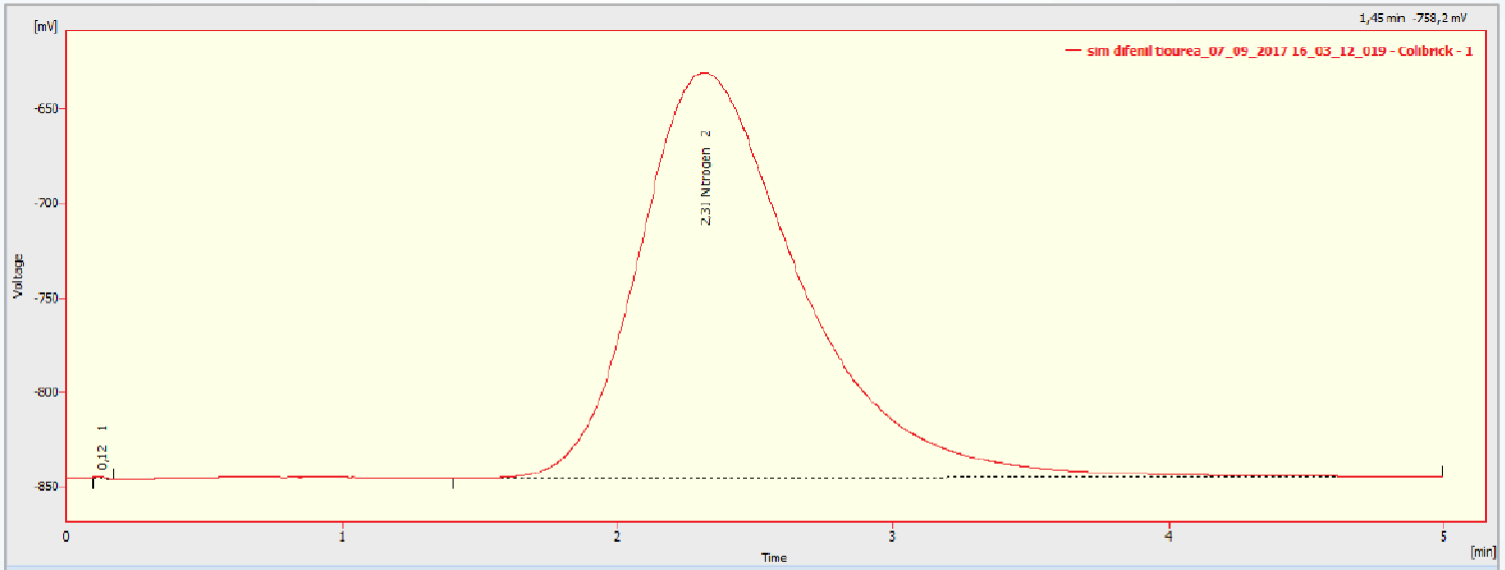
ECS 8060 – Standard example –Atropine



Summary Table

		Sample ID	Sample Weight [mg]	Nitrogen			
				Area [mV.s]	Weight [mg]	Weight [%]	Element Name
atropina _07_09_2017 15_58_11_018	Colbrick - 1	atropina	25,700	3794,646	1,210	4,71	Nitrogen

ECS 8060 – Standard example –Thiourea



Summary Table

		Sample ID	Sample Weight [mg]	Nitrogen			
				Area [mV.s]	Weight [mg]	Weight [%]	Element Name
sim difenil tourea_07_09_2017 16_03_12_019	Colibrick - 1	sim difeni tio	23,200	8749,906	2,811	12,12	Nitrogen

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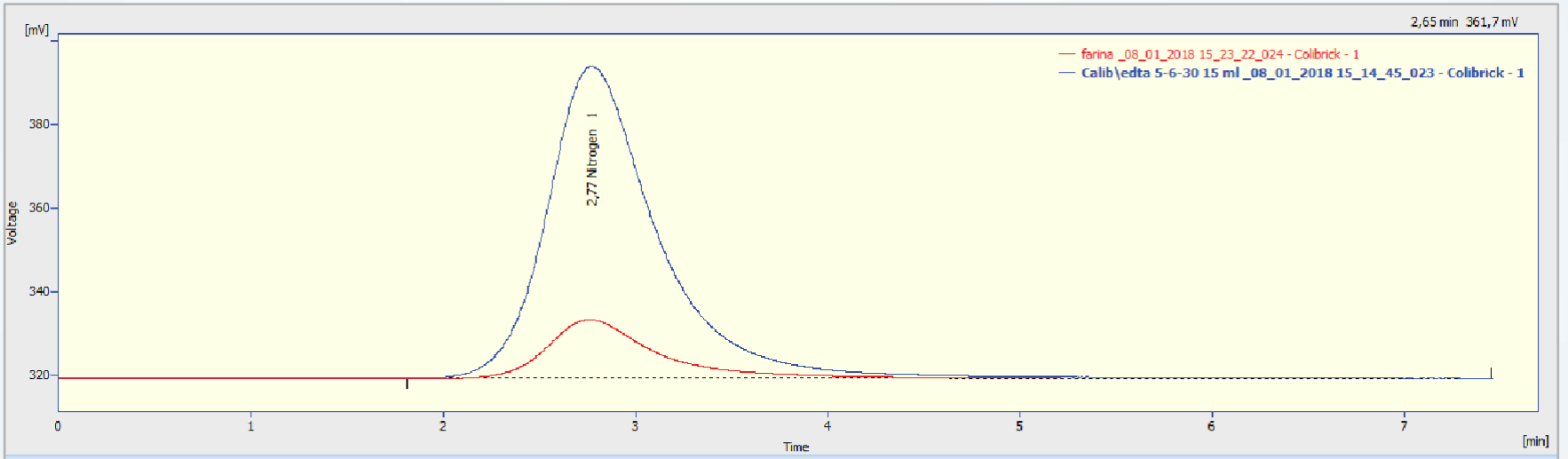
ECS 8060 – EDTA vs wheat flour sample

High repeatability and reproducibility of analysis



Summary Table

		Sample ID	Sample Weight [mg]	Nitrogen			
				Area [mV.s]	Response	Weight [mg]	Weight [%]
farina _08_01_2018 15_23_22_024	Colibrick - 1	farina	59,672	569,956	569,956	1,023	1,71
Calib\edta 5-6-30 15 ml _08_01_2018 15_14_45_02	Colibrick - 1	edta 5-6-30	56,277	3007,217	3007,217	5,397	9,59

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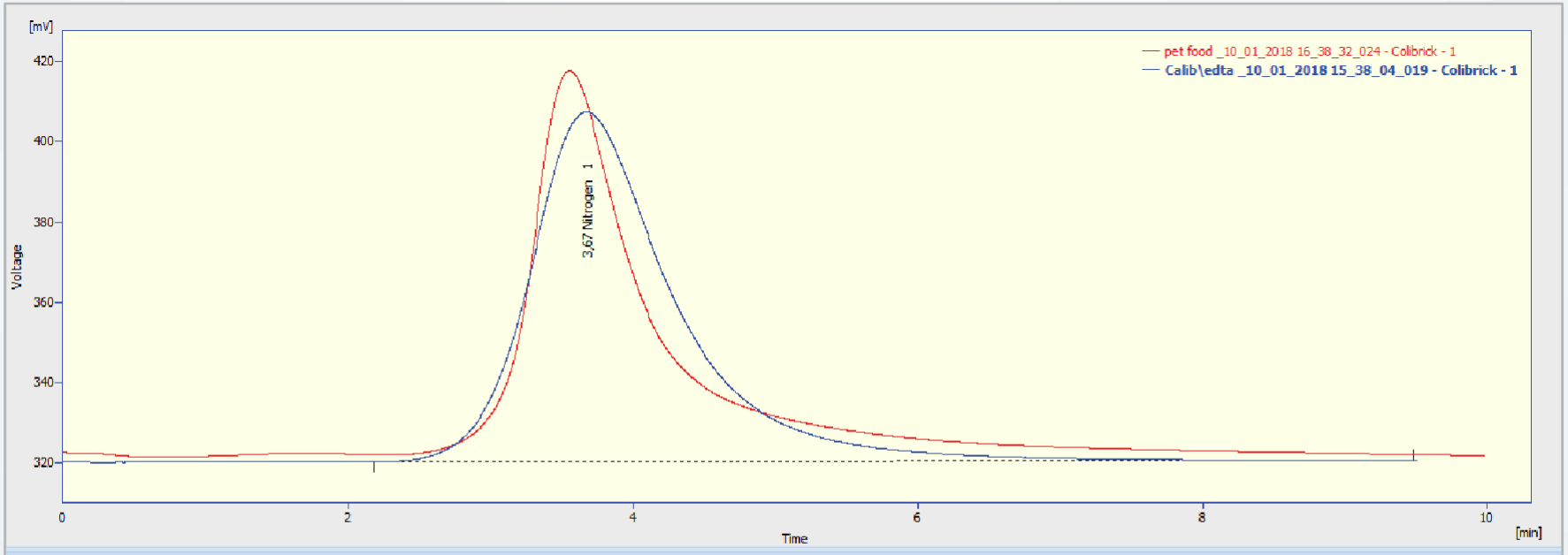
ECS 8060 – EDTA vs dog crunches sample

Possibility of high sample dosage with the same analysis performances



Summary Table

		Sample ID	Sample Weight [mg]	Nitrogen			
				Area [mV.s]	Response	Weight [mg]	Weight [%]
pet food _10_01_2018 16_38_32_024	Colibrick - 1	pet food	158,146	5774,050	5774,050	6,347	4,01
Calib\edta _10_01_2018 15_38_04_019	Colibrick - 1	edta	70,878	6184,005	6184,005	6,797	9,59

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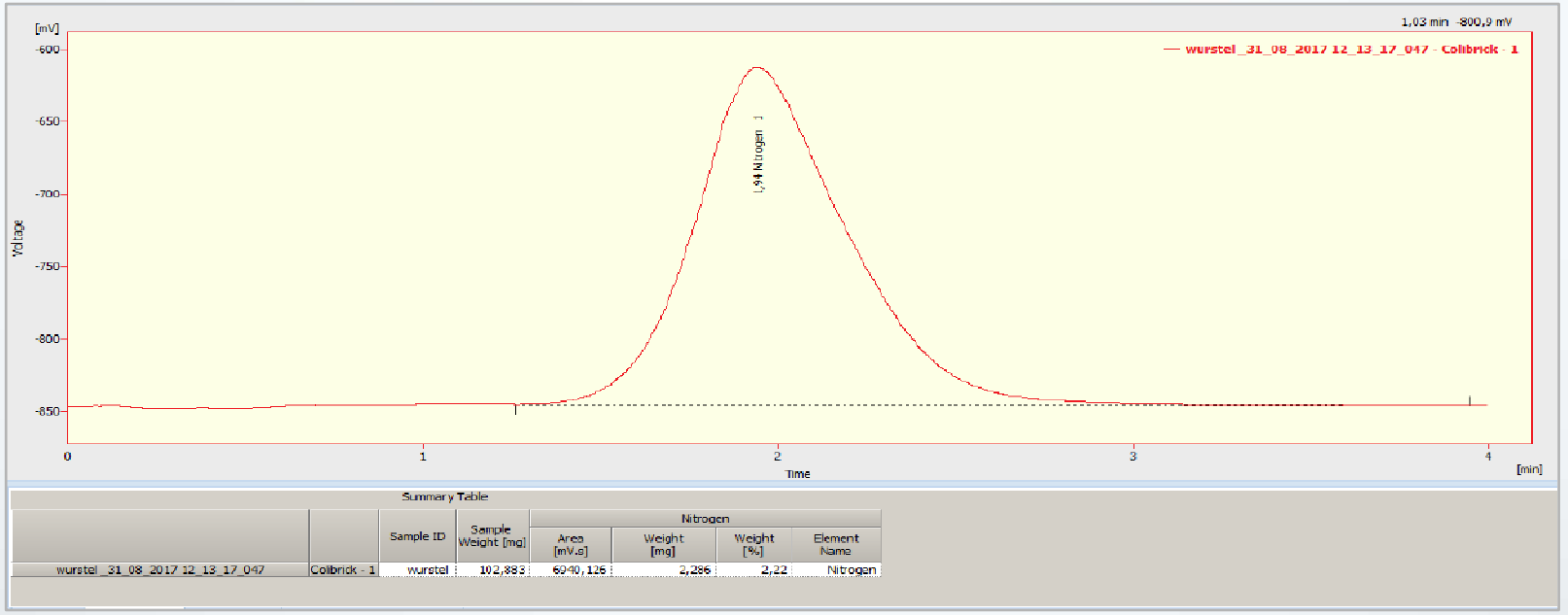
ECS 8060 – N, proteins configuration – Meat (wurstel)

	Sample weight	Nitrogen	Nitrogen
Wurstel	[mg]	weight [mg]	weight [%]
N analysis	47.511	1.037	2.18
	71.333	1.85	2.59
	102.883	2.286	2.22
		Average	2.33
		Std. Dev.	0.23
		RDS %	9.70



Summary Teble

		Sample ID	Sample Weight [mg]	Nitrogen			
				Area [mV.s]	Weight [mg]	Weight [%]	Element Name
wurstel_31_08_2017 12_13_17_047	Colibrick - 1	wurstel	102,883	6940,126	2,286	2,22	Nitrogen

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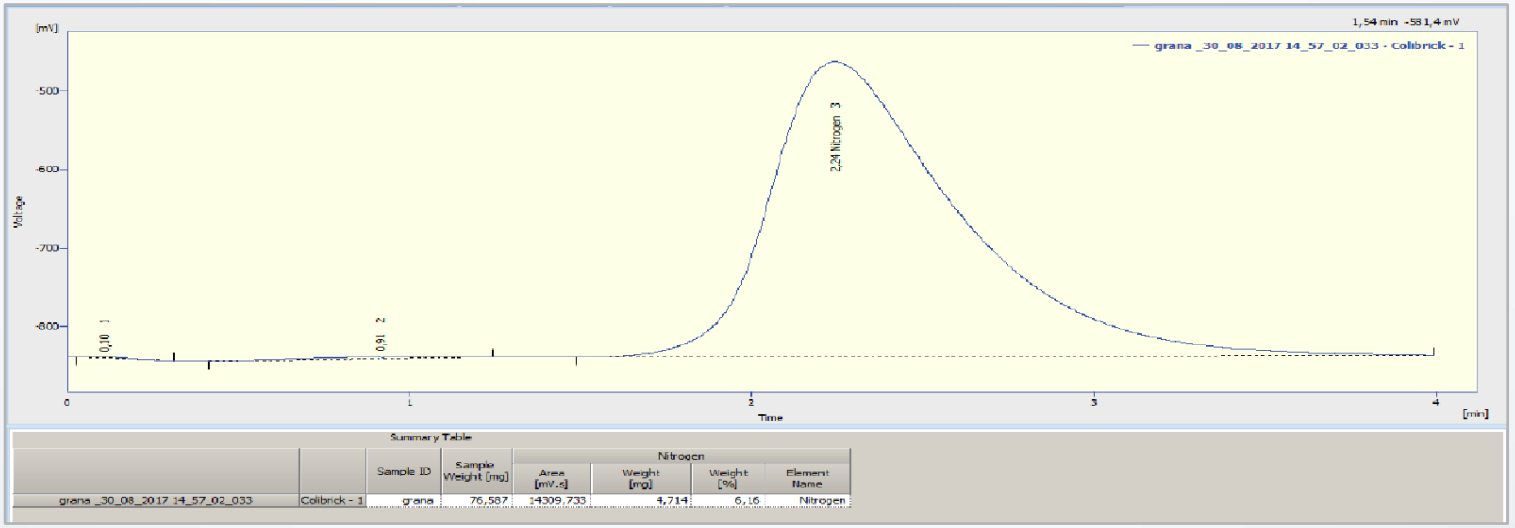
ECS 8060 – N, proteins configuration – Cheese

	Sample weight	Nitrogen	Nitrogen
Cheese	[mg]	weight [mg]	weight [%]
N analysis	76.58	4.714	6.16
	105.81	7.035	6.65
		Average	6.41
		Std. Dev.	0.35
		RDS %	5.4



Summary Table

		Sample ID	Sample Weight [mg]	Nitrogen Area [mV.s]	Nitrogen Weight [mg]	Nitrogen Weight [%]	Nitrogen Element Name
grana _30_08_2017 14_57_02_033	Colibrick - 1	grana	76,587	14309,733	4,714	6,16	Nitrogen

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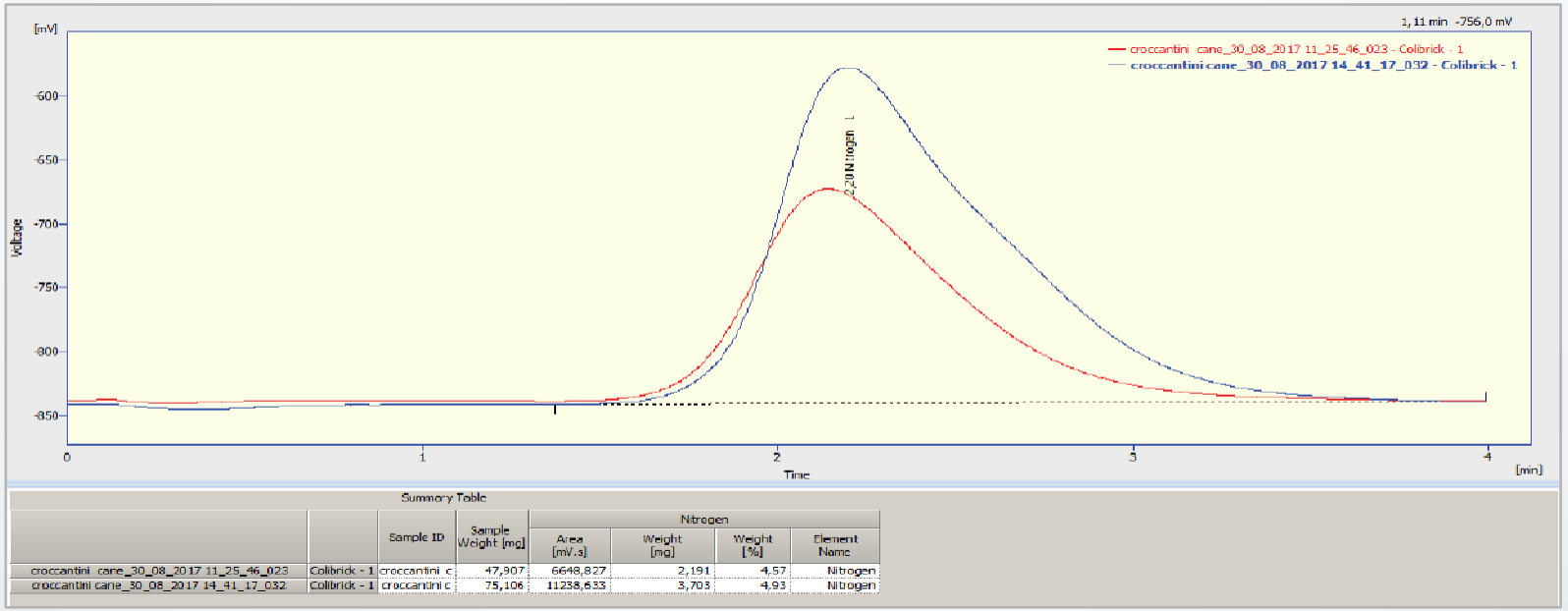
ECS 8060 – N, proteins configuration – Dog crunches

	Sample weight	Nitrogen	Nitrogen
Dog crunches	[mg]	weight [mg]	weight [%]
N analysis	47.907	2.191	4.57
	75.106	3.703	4.93
		Average	4.75
		Std. Dev.	0.25
		RDS %	5.36



Summary Table

		Sample ID	Sample Weight [mg]	Nitrogen			
				Area [mV.s]	Weight [mg]	Weight [%]	Element Name
croccantini cane_30_08_2017 11_25_46_023	Colibrick - 1	croccantini c	47,907	6648,827	2,191	4,57	Nitrogen
croccantini cane_30_08_2017 14_41_17_032	Colibrick - 1	croccantini c	75,106	11238,633	3,703	4,93	Nitrogen

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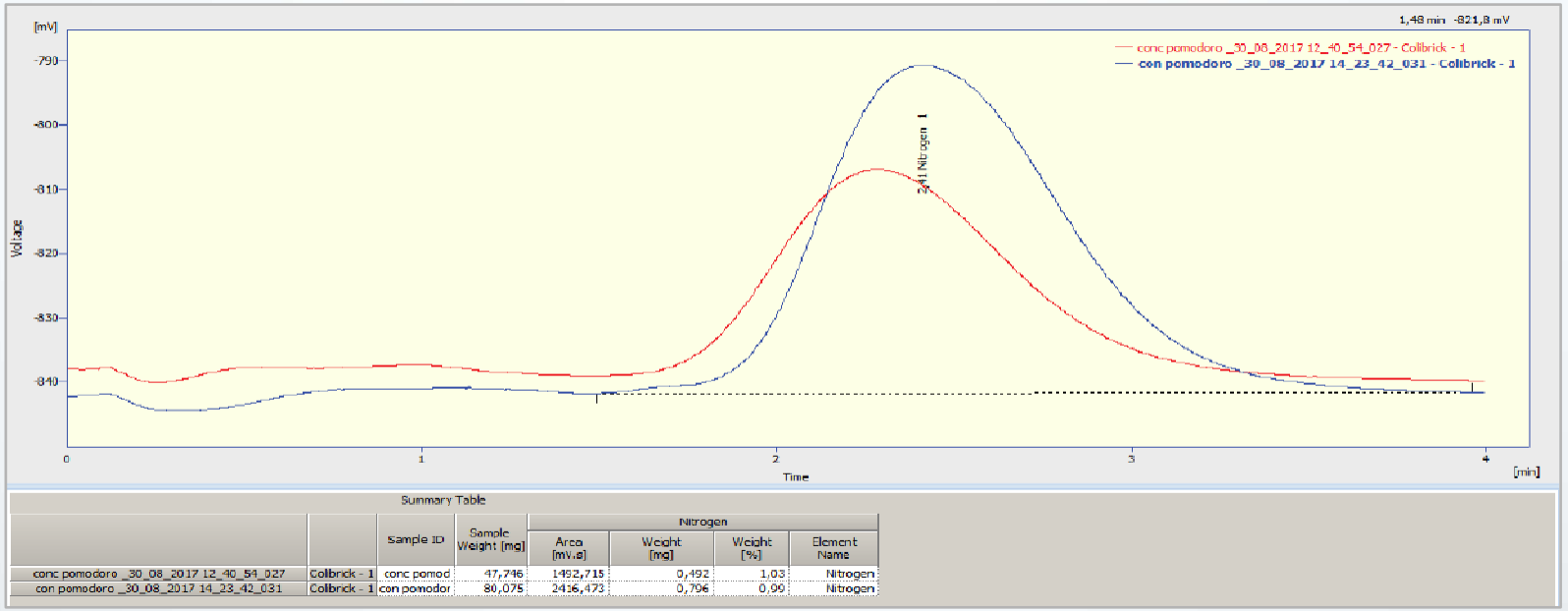
ECS 8060 – N, proteins configuration – Tomato paste

	Sample weight	Nitrogen	Nitrogen
Tomato Paste	[mg]	weight [mg]	weight [%]
N analysis	47.746	0.492	1.03
	80.075	0.796	0.99
		Average	1.01
		Std. Dev.	0.03
		RDS %	2.80



Summary Table

		Sample ID	Sample Weight [mg]	Nitrogen			
				Area [mV.s]	Weight [mg]	Weight [%]	Element Name
conc pomodoro _30_08_2017 12_40_54_027	Colibrick - 1	conc pomod	47,746	1452,715	0,492	1,03	Nitrogen
con pomodoro _30_08_2017 14_23_42_031	Colibrick - 1	con pomodor	80,075	2436,473	0,796	0,99	Nitrogen

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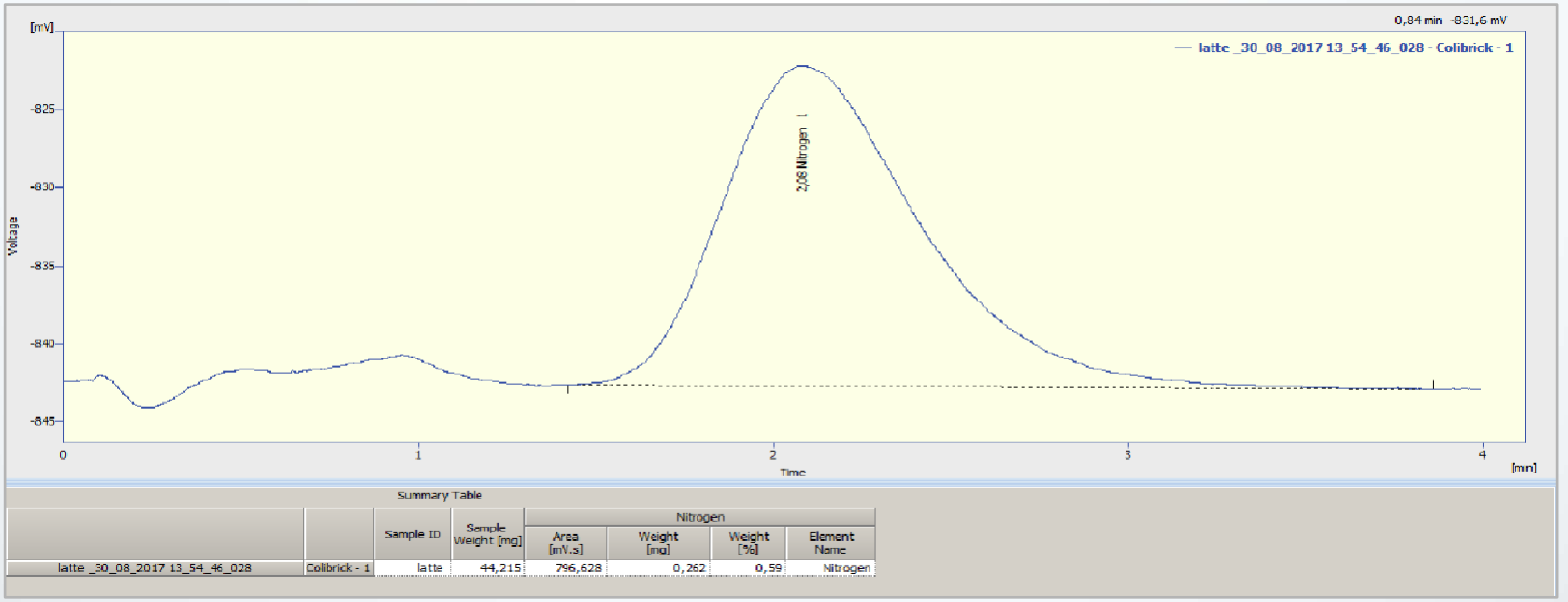
ECS 8060 – N, proteins configuration – Milk

	Sample weight	Nitrogen	Nitrogen
Milk	[mg]	weight [mg]	weight [%]
N analysis	44.215	0.262	0.59
	77.81	0.487	0.63
		Average	0.61
		Std. Dev.	0.03
		RDS %	4.64



Summary Table

		Sample ID	Sample Weight [mg]	Nitrogen			
				Area [mV.s]	Weight [mg]	Weight [%]	Element Name
latte _30_08_2017 13_54_46_028	Colibrick - 1	latte	44,215	796,628	0,262	0,59	Nitrogen

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