TOTAL FAT ANALYSIS

MILESTONE

HELPING CHEMISTS

Introducing :
Closed Vessel
Microwave Assisted Extraction
for TOTAL FAT
Gravimetric Analysis

UNICAM
Sistemas Analíticos, Lda.

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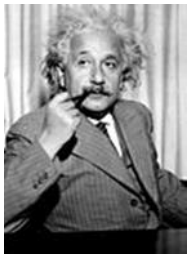
NEW WORKFLOW

- *Faster*
- *Equivalent or better than traditional method*
- *Uses less solvent*
- **Greener method**

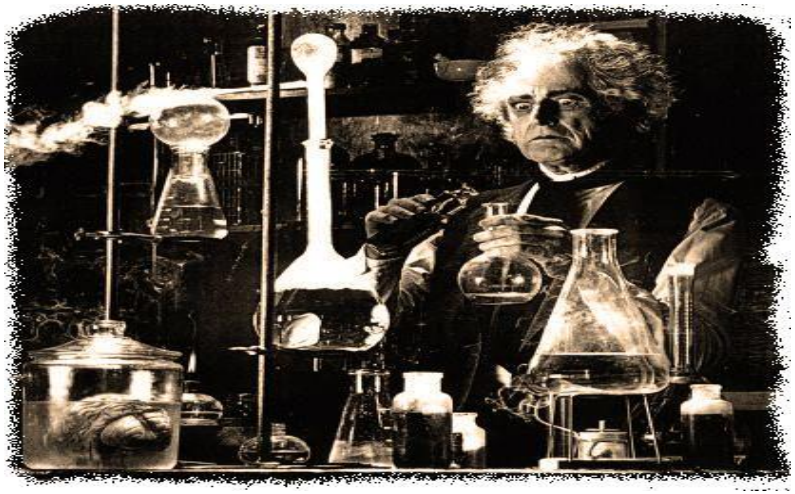
1879

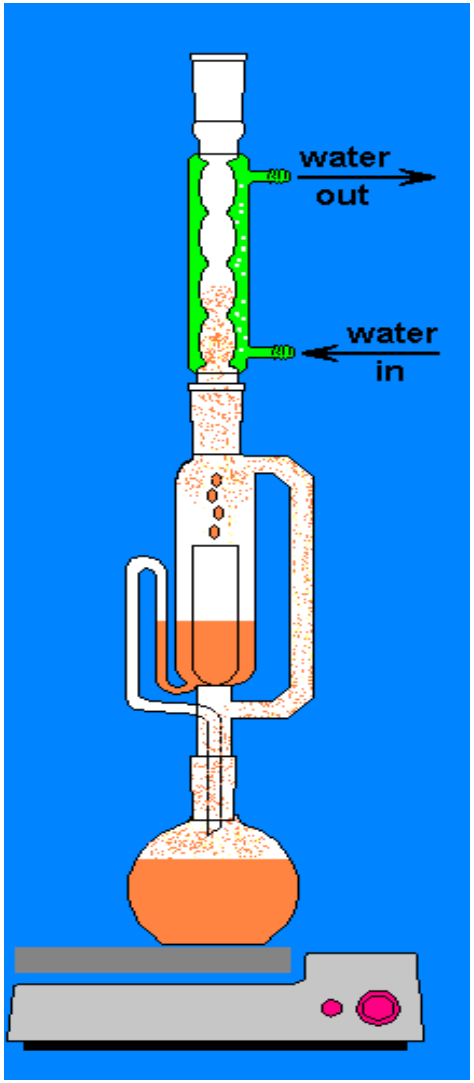


- King: Luís I de Portugal
- President of the Council of Ministers: Fontes Pereira de Melo (until 1 June), Anselmo José Braamcamp (from 1 June)
- Russia and the United Kingdom sign the Treaty of Gandamak, establishing an Afghan state.
- The first female students are admitted to study for degrees of the University of Oxford in England
- Thomas Edison demonstrates incandescent lighting to the public for the first time, in Menlo Park, New Jersey.

1879 : Soxhlet Method

- 1879 To extract lipids from samples





Total Fat

- Food Labeling Regulation EU No. 1169/2011
- Total lipids, including phospholipids
- Association of Official Analytical Chemists (AOAC 2005)

AOAC 2005

- Acid Hydrolysis

Hydrolyses protein

Hydrolyses Triglycerides

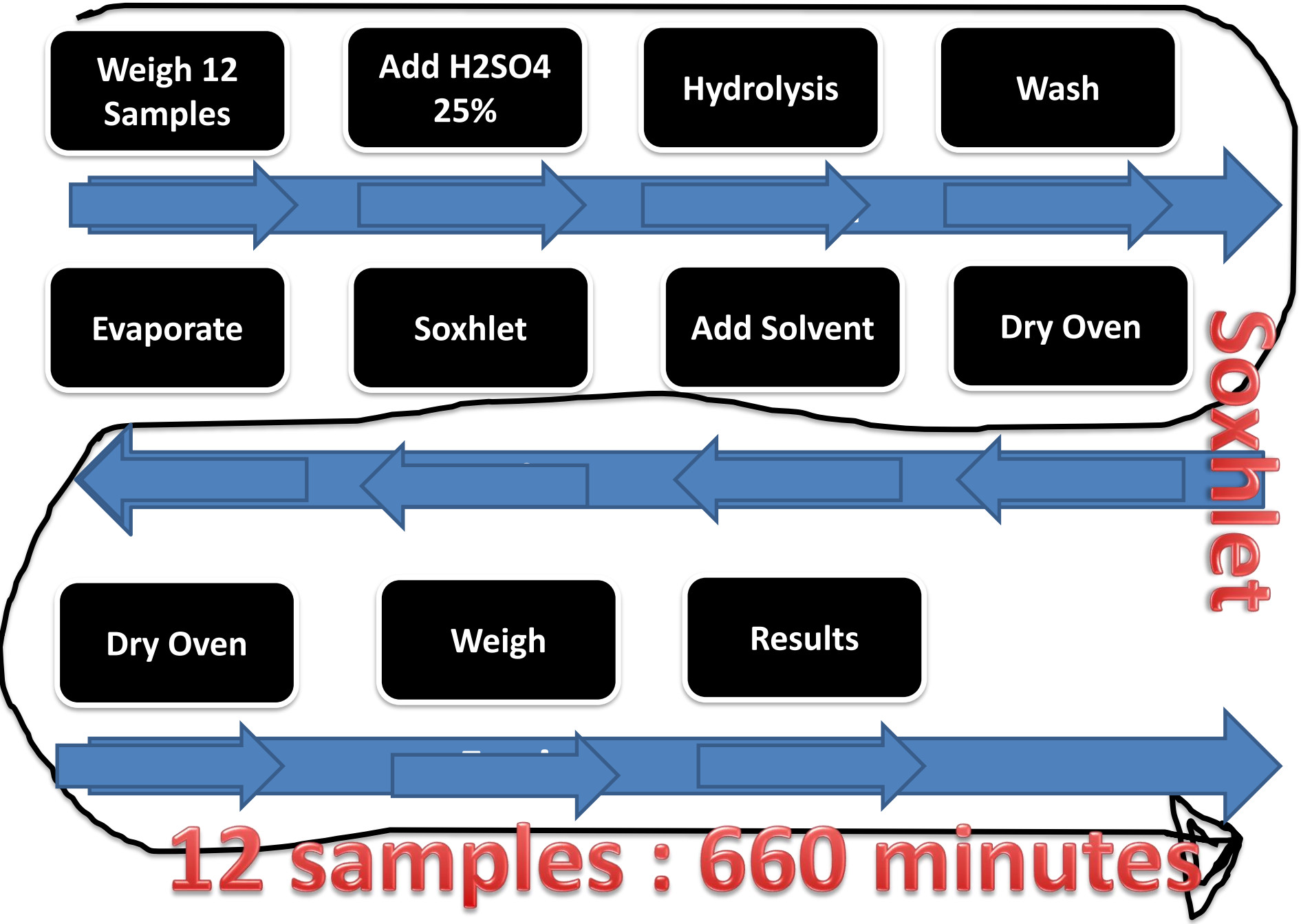
STEP 1

- Soxhlet Extraction

Non Polar Solvent

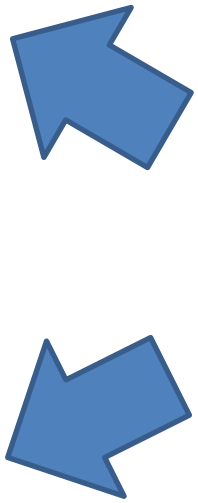
extraction of lipids

STEP 2


Weigh 12 Samples
Add H2SO4 25%
Hydrolysis
Wash
Evaporate
Soxhlet
Add Solvent
Dry Oven
Soxhlet
Dry Oven
Weigh
Results
12 samples : 660 minutes

Microwave Workflow

- **Hydrolysis**



STEP 1

- **Extraction**

TOTAL FAT ANALYSIS

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MW

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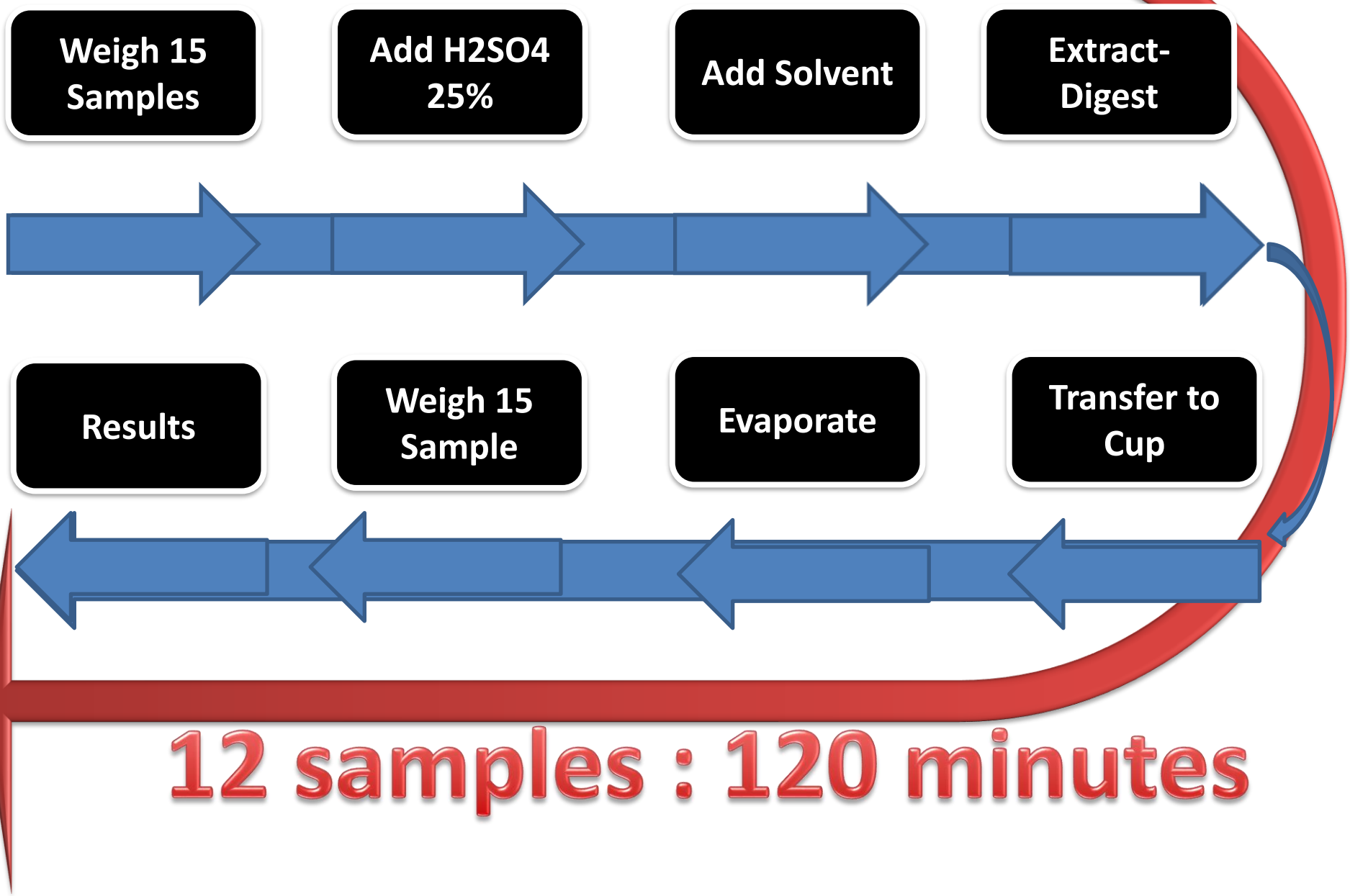
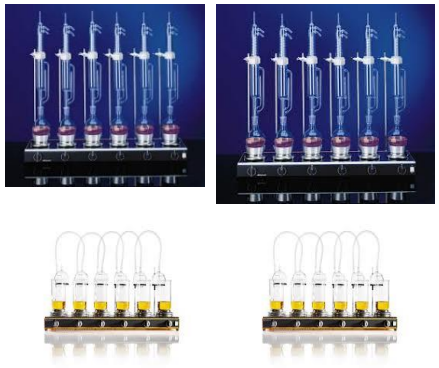


12 samples : 120 minutes

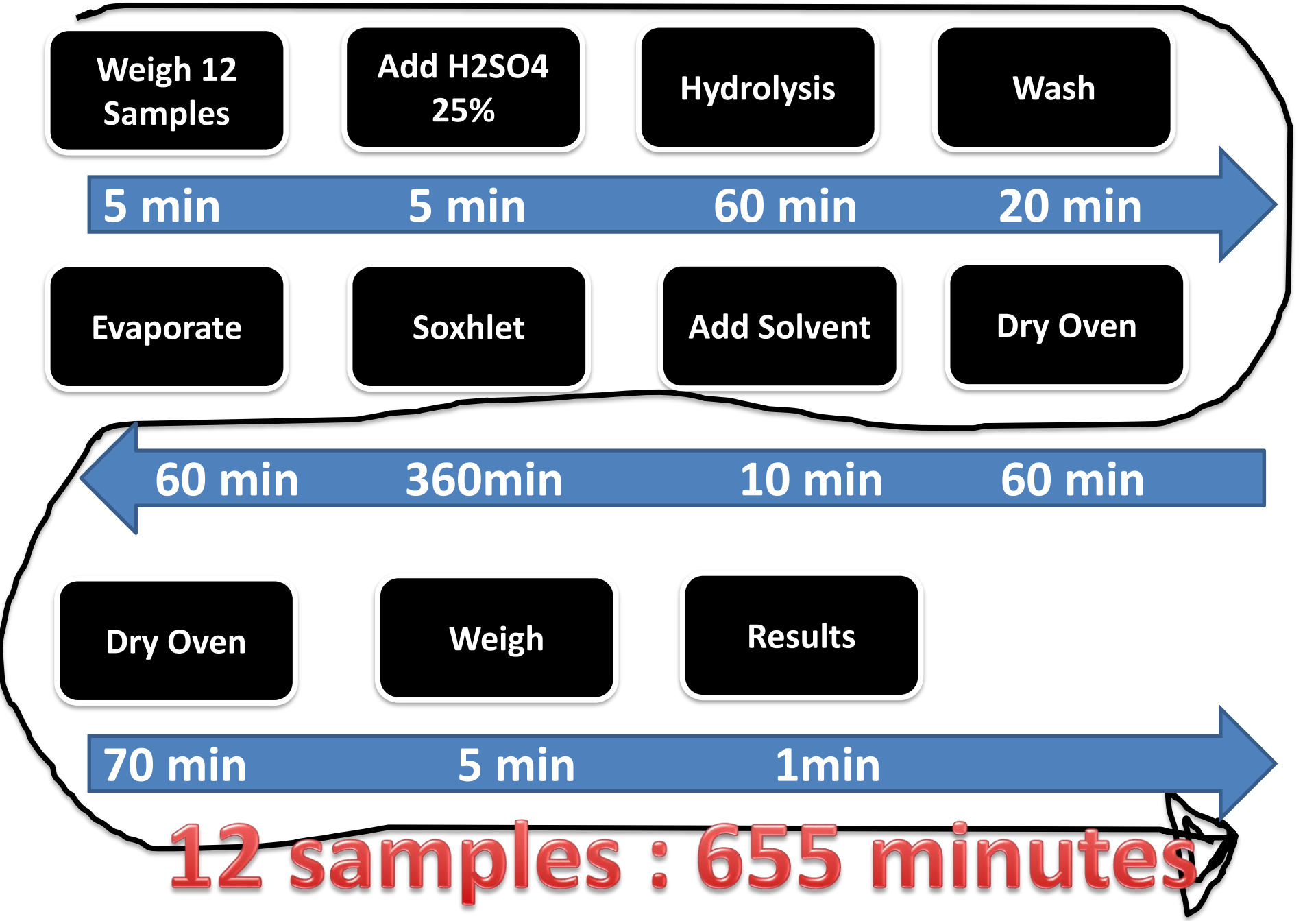
Units	Samples/ day	Samples/ WEEK
1	45	250

Units	Samples/ day	Samples/ WEEK
2	90	500



Units	Samples/ day	Samples/ WEEK
12	0/6	24

Units	Samples/ day	Samples/ WEEK
24	0/12	48


Weigh 12 Samples
Add H2SO4 25%
Hydrolysis
Wash
5 min
5 min
60 min
20 min
Evaporate
Soxhlet
Add Solvent
Dry Oven
60 min
360min
10 min
60 min
Dry Oven
Weigh
Results
70 min
5 min
1min
12 samples : 655 minutes

Weigh 12 Samples
Add H2SO4 25%
5 min
5 min
20 min
Evaporate
Soxhlet
Add Solvent
60 min
10 min
Weigh
Results
70 min
5 min
1min
MW : LESS STEPS

ETHOS X
www.milestonesrl.com

Investment

Method Validation

Validation Based on Method

Cheese Samples

- **8 Cheese Samples**
- **1 Certified Material**
- **Samples are collected from certified producers of Beira Interior, Portugal**
- **Quantitative analyses by : NIR, AOAC 2005, Microwave Extraction**

Results

Sample	MAE 12reps	Soxhlet 12reps	NIR (1rep)
1	30.21 ± 0.80	29.40 ± 0.36	30.31 ± 0.01
2	24.92 ± 1.38	26.21 ± 2.61	24.64 ± 0.03
3	24.95 ± 1.02	25.47 ± 0.37	24.04 ± 0.01
4	25.89 ± 2.05	27.22 ± 2.48	25.05 ± 0.07
5	28.52 ± 1.03	28.00 ± 1.53	29.10 ± 0.01
6	27.96 ± 1.35	28.80 ± 1.69	28.31 ± 0.04
7	28.62 ± 1.74	31.25 ± 0.15	30.09 ± 0.01
8	29.23 ± 1.29	29.72 ± 1.17	28.77 ± 0.01

Conclussions

- Results are comparable between the 3 different methodologies
- Other Matrixes tested:

Milk

Yoghurt and Low fat youghurt

Fish

Meat

Sausages

Olives

Reference Material

Run	Total Fat
1	23.95%
2	23.94%
3	24.43%
4	24.39%
5	24.25%
6	23.95%

6 sample run 6 replicates each

		SD	RSD
Average	24.15%	0.23%	0.96%
Ref Value	24.40%	0.19%	0.78%

Method Validation Services

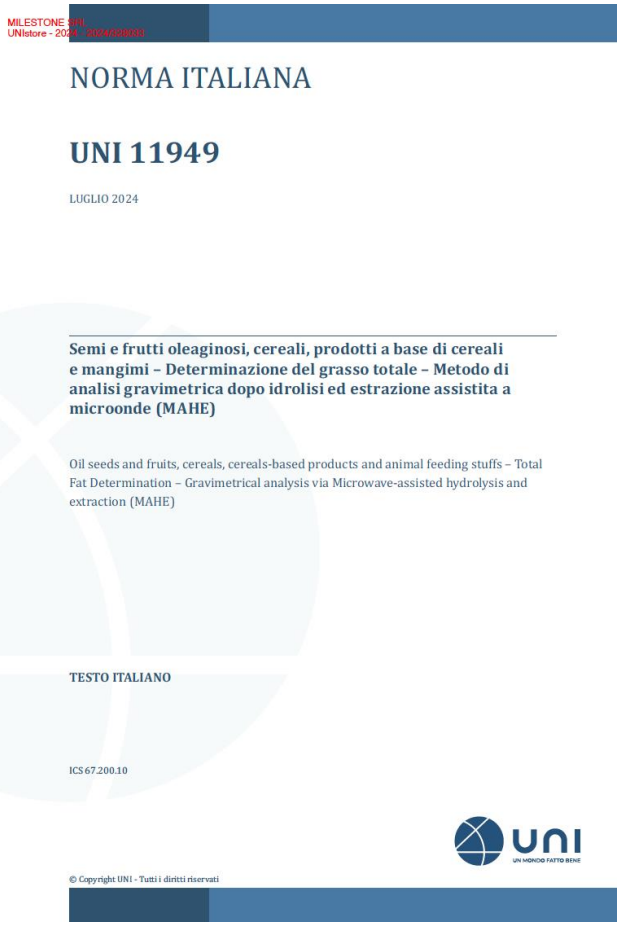
- Method Development verification
- Validation of the method with one of your Matrix/Samples on our Lab
- Validation Documentation
- Report
- More types of Matrixes/Samples on request

Conclusion

- Fast Return of your investment
- Lab savings : energy, solvents, personnel
- Modern **GREEN Methodology**
- **Fast and reliable** Results for your lab
- Universal Methodology
- NON “OFFICIAL” Method
- ETHOS X is a simple and productive tool for your TOTAL FAT determinations

Ultima Hora

- **UNI 11949:2024**
- Oil seeds and fruits, cereals, cereals-based products and animal feeding stuffs - Total Fat Determination - Gravimetrical analysis via Microwave-assisted hydrolysis and extraction (MAHE)
- https://store.uni.com/en/uni-11949-2024
- Availability date: 18 July 2024



MILESTONE SRL
UNIstore - 2024-6206053

NORMA ITALIANA

UNI 11949

LUGLIO 2024

Semi e frutti oleaginosi, cereali, prodotti a base di cereali e mangimi – Determinazione del grasso totale – Metodo di analisi gravimetrica dopo idrolisi ed estrazione assistita a microonde (MAHE)

Oil seeds and fruits, cereals, cereals-based products and animal feeding stuffs – Total Fat Determination – Gravimetrical analysis via Microwave-assisted hydrolysis and extraction (MAHE)

TESTO ITALIANO

ICS 67.200.10

UNI
UN MONDO FATTO BENE

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