FOODLAB®

Quality control systems for food and beverage

CDR FoodLab®, the system for the quality control of Oils&Fats

SIMONE BELLASSAI
CDR FoodLab® Division Manager

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CDR, a “workshop” of ideas and continuous innovation

CDR conducts its business in heterogeneous sectors

SECTORS

TELEMATIC SYSTEMS
Automatic Toll collection terminals

MEDICAL DIAGNOSTICS
Hematology and hemostasis systems

FOOD DIAGNOSTICS
Analysis systems for food and beverage

SENSORING SYSTEMS
Sensors and probes for QC

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- Milk and Dairy Products
- Egg Products
- Tomato/Vegetable puree
- Bakery products

➢ CDR FoodLab®

- Wine
- Beer and Water
- Cider
- Kombucha

➢ CDR WineLab®

➢ CDR BeerLab®

➢ CDR CiderLab

➢ CDR KombuchaLab

- All kinds of vegetable oils
- All kinds of animal fats
- Nuts/hard-shelled fruits

➢ CDR FoodLab®

➢ CDR OxiTester

➢ CDR PalmOilTester

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Canada
USA
Mexico
Guatemala
Jamaica
Trinidad e Tobago

Colombia
Ecuador
Suriname
Perù
Chile
Argentina
Brazil
Paraguay
Uruguay

Island
Finland
Norway
Sweden
Denmark
Russsia
Austria
Switzerland

Ireland
Belgium
France
United Kingdom
Netherland
Germany
Monaco
Italy
Spain
Portugal
Greece

Estonia
Latvia
Lithuania
Poland
Cezh Republic
Ukraine
Slovakia

Hungary
Romania
Bulgaria
Serbia
Slovenia
Croatia
Albania

Morocco
Algeria
Tunisie
Libya
Egypt
Sudan
Uganda
Ivory Coast
Togo
Ghana
Nigeria
Cameroon
Gabon
Congo

Seychelles
Kenya
Tanzania
Burundi
Ruanda
Botswana
South Africa

Turkey
Azerbaijan
Cyprus
Syria
Iraq
Kuwait
Iran
Jordan
Lebanon
Israel
Palestine
Saudi Arabia
Emirates
Baharain

China
Mongolia
Japan
South Korea
Philippines
Mauritius
Myanmar
Vietnam
Thailand
Taiwan
Bangladesh
India
Pakistan
Indonesia
Malaysia
Singapore
Sri Lanka

Australia
New Zeland
New Caledonia
Papua New Guinea

More than 100 countries

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CDR FoodLab® is a range of chemical analysis systems, easy to use and versatile, that allows to determine a wide panel of parameters on food and beverage

CDR FoodLab® is composed by thermostated analyzers based on photometric technology that uses LED emitters at fixed wavelengths

Pipette to collect the sample

Analysis kits are supplied in package of 10 tests, containing ready to use pre-filled reagents, designed and produced by CDR

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Which are the most important features and advantages of CDR systems compared to the traditional methods?

Reduced testing times

Easy to use

Ready to use reagents

Possibility to use the analyzer at line in the processing plant

Maintenance free

Calibration free

Everyone can use CDR FoodLab® line

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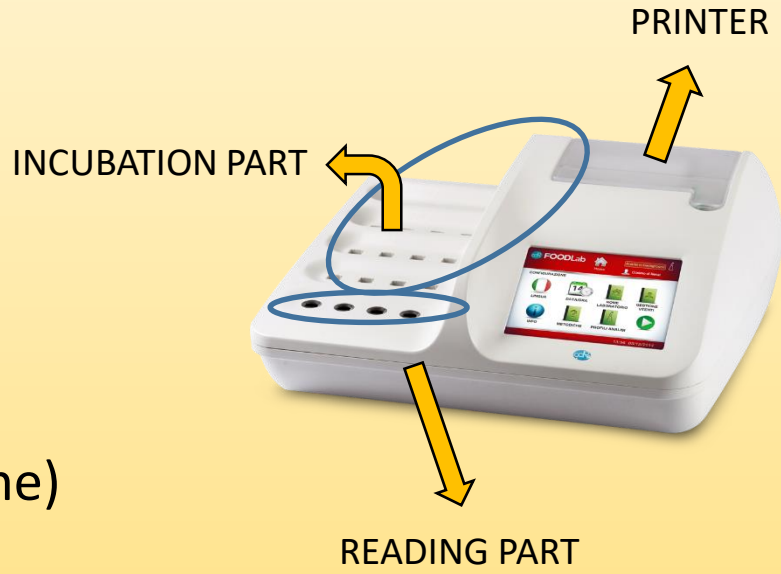
INSTRUMENT's FEATURES

- ✓ No maintenance
- ✓ No calibration!!!
- ✓ 16 analyses in about 10 mins (analyses by session)
- ✓ Multitasking mode (different analyses at the same time)
- ✓ 3 years warranty
- ✓ Touch screen where procedures are explained step by step



Reading cells and incubation positions are thermostated at 37°C

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INSTRUMENT's FEATURES

The reading cell

The range in absorbance is
0,000 - 6,000

Standard photometry

The range in absorbance is
0,000 - 2,000/3,000

The range in absorbance is 2-3 times more than
normal standard photometry

CDR FoodLab® system

CDR FoodLab®

It can do analysis on all the matrices available

- With printer
- 16 analysis of the same type at the same time
- MULTITASKING mode that means different a analysis at the same time

CDR FoodLab® Jr.

It can be configured with FFA, PV, AnV, Soaps and Iodine Value

- Without printer
- 3 analysis of the customer choice
- No MULTITASKING

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REAGENTS' FEATURES

- ✓ Pre-filled cuvettes
- ✓ Ready to use reagents
- ✓ Microquantity of sample
- ✓ You don't need any calibration
- ✓ Long shelf-life of the reagents

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THE READING CELL

The detectable range of
ABSORBANCE is 0,000 – 6,000

Standard photometry

The detectable range of
ABSORBANCE is 0,000 – 2,000/3,000

The range of ABSORBANCE of CDR FoodLab®
is 2-3 times wide as it is wide the one of a standard spectrophotometer

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Comparison with standard photometry

Standard photometry

- CDR reagents CALIBRATED AND READY TO USE
- Thermostated instrument
- Short reaction times thanks to thermostated element
- High preformance reading cell in terms of calibration and long-life
- Maintenance not required
- Skilled technicians not required
- Wider ABSORBANCE range (ABS 0,000 – 6,000)

- Enzymatic kits to be prepared and calibrated
- Instrument usually not thermostated
- Longer reaction times
- Short-life reading cell, in case of frequent use
- Maintenance required
- Skilled technicians required
- Shorter ABS range (ABS 0,000 – 2,000)

ADVANTAGES of CDR FoodLab®

- Easy to use
- Strong system
- No calibration or check is required
- Everyone can use the system, you don’t need any technical background
- Wider Absorbance range (ABS 0,000 – 6,000)
- Possibility to get real time results

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CDR FoodLab® system

Egg products

Oils&Fats

Milk&Dairy products

Tomato

Bakery products

With CDR FoodLab®you can carry out easily and quickly on different matrices analysing **liquid** and **solid samples**

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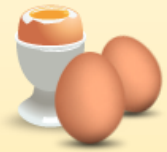
CDR FoodLab® system

Bakery products

- Free Fatty Acids (FFA)
- Peroxide Value
- p-Anisidine Value
- Lactose
- Alcohol on final product
- Alcohol by Volume in the antibacterial solution

Egg Products

- Lactic Acid
- D-3-hydroxybutyric acid
- Colour (Beta-Carotene)
- Cholesterol



Milk and Dairy products

- Lactose
- L-Lactic acid
- Milk Urea Nitrogen (MUN)
- Alkaline phosphatase (ALP)
- Ammonia
- Chloride
- Hydrogen peroxide
- ε-fructosyl-lisine (Furosine)
- Peroxidase

Oils&Fats

- Free Fatty Acids
- Peroxide Value
- Anisidine Value (AnV)
- Soaps Test
- Iodine Value test

• Tomate

- Reducing Sugar
- Lactic acid (D+L)
- Chloride

You can carry out analysis of FFA, PV and AnV
on **Nuts/Hard shelled fruits**

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A focus on the most important analyses in Oils&Fats industry

- *Free Fatty Acid (FFA)* → **It is the most important parameter related to the quality of the oil/fat**
- *Peroxide Value (PV)* → **It is the primary oxidation state of the oil/fat**
- *Anisidine Value (AnV)* → **It is the secondary oxidation state of the oil/fat**

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Which are the traditional methods for FFA, PV and AnV?

Free Fatty Acids	→	Titration
Peroxide Value	→	Titration
Anisidine Value	→	Chemical reaction detected photometrically

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Free Fatty Acids (FFA)

Traditional method
(Titration)

- 50-100mL of solvent
- Sodium hydroxide
- Glassware
- Fume hood
- Phenolphthalein

Estimated time: 5 minutes

CDR FoodLab® system

- CDR FoodLab® analyser
- 1 mL in pre-filled cuvette

Estimated time: 10 seconds

Analyses session of 16 samples at the same time in 10 minutes

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Peroxides Values (PV)

Traditional method
(Titration)

- 25mL of mixture glacial acetic acid/chloroforme
- $Na_2S_2O_3$ solution
- KI solution
- Starch solution
- Glassware
- Fume hood

Estimated time: 10 minutes

CDR FoodLab® system

- CDR FoodLab® analyser
- 1 mL in pre-filled cuvette
- 10uL of R2 reagent

Analysis time: 3 minutes

Analyses session of 16 samples at the same time in 10 minutes

Anisidine Value (AnV)

Photometric analysis

- 25mL of isooctane
- Glacial acetic acid
- p-Anisidine in glacial acetic acid
- Photometer (reading at 350nm)
- Glassware
- Fume hood

Estimated time: 15 minutes

CDR FoodLab® system

- CDR FoodLab® analyser
- 1 mL in pre-filled cuvette

NO carcinogenic reagent!

Analysis time: 1 minute

Kinetic reaction: samples have to be prepared one by one

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CDR FoodLab®
Measuring ranges

- Free Fatty acids (0,01 – 26% oleic acid)
- Peroxides Value (0,01 – 550 meqO_2/Kg)
- Anisidine Value (0,5 – 100 AnV)

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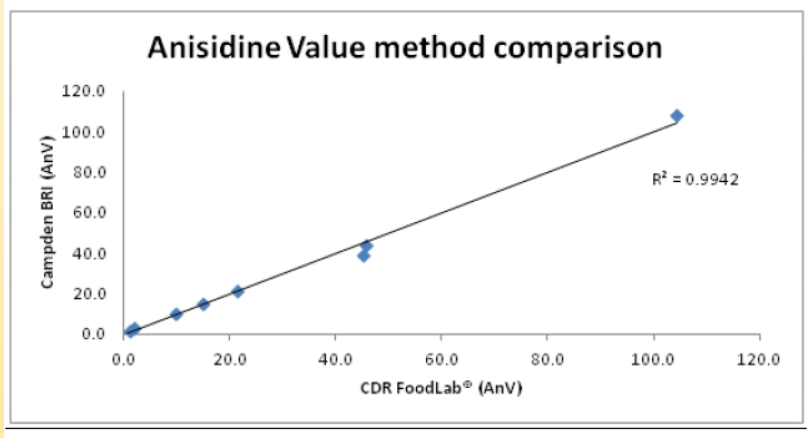
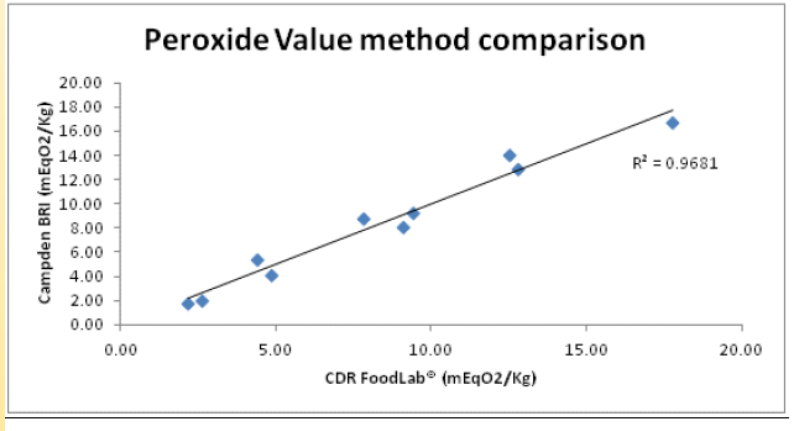
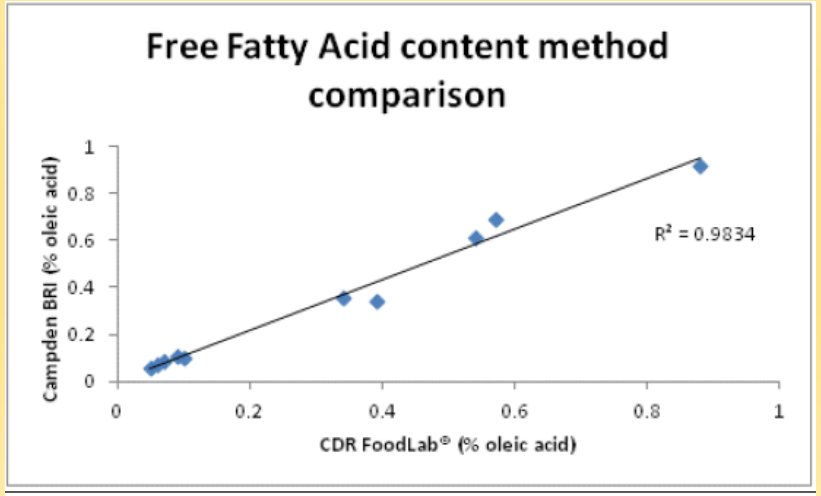
CDR FoodLab®
Correlation with the reference method







CDR FoodLab®
Repeatability

Anisidine Value

	CDR FoodLab® data	Campden BRI reference method data
Replicate number	Anisidine (AnV)	Anisidine (AnV)
1	5.1	5.1
2	5.2	5.1
3	5.2	5.1
4	4.9	5.0
5	5.3	5.2
6	5.3	5.1
7	5	5.2
8	5.1	5.3
9	5.3	5.1
10	5.2	5.1
Mean	**5.2**	**5.1**
Standard deviation	**0.13**	**0.07**

Table 5 Repeatability for Anisidine Value (using Olive Oil 3)

Peroxide Value

	CDR FoodLab® data	Campden BRI reference method data
Replicate number	Peroxides (mEq O_2/kg)	Peroxides (mEq O_2/kg)
1	9.22	9.69
2	10.51	9.13
3	10.56	9.57
4	9.33	9.66
5	9.25	9.57
6	9.38	9.41
7	9.3	9.25
8	9.1	9.92
9	9.14	9.15
10	9.31	9.76
Mean	**9.51**	**9.51**
Standard deviation	**0.52**	**0.27**

Table 6 Repeatability for Peroxide Value (using Olive Oil 3)

Free Fatty Acid content

	CDR FoodLab® data	Campden BRI reference method data
Replicate number	FFA (% oleic acid)	FFA (% oleic acid)
1	0.36	0.37
2	0.34	0.35
3	0.33	0.36
4	0.34	0.35
5	0.34	0.35
6	0.35	0.36
7	0.34	0.36
8	0.35	0.35
9	0.35	0.35
10	0.34	0.35
Mean	**0.34**	**0.36**
Standard deviation	**0.01**	**0.01**

Table 7 Repeatability for Free Fatty Acid content (using Olive Oil 3)

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LIQUID SAMPLES

Oils

We can analyze crude or refined

We don’t have any problem of colour or viscosity

In case of solid fat, it is enough to melt it to collect it and carry out the analysis

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Solid Samples

Nuts/Hard shelled fruits/ Seeds

Flours

Pet Food

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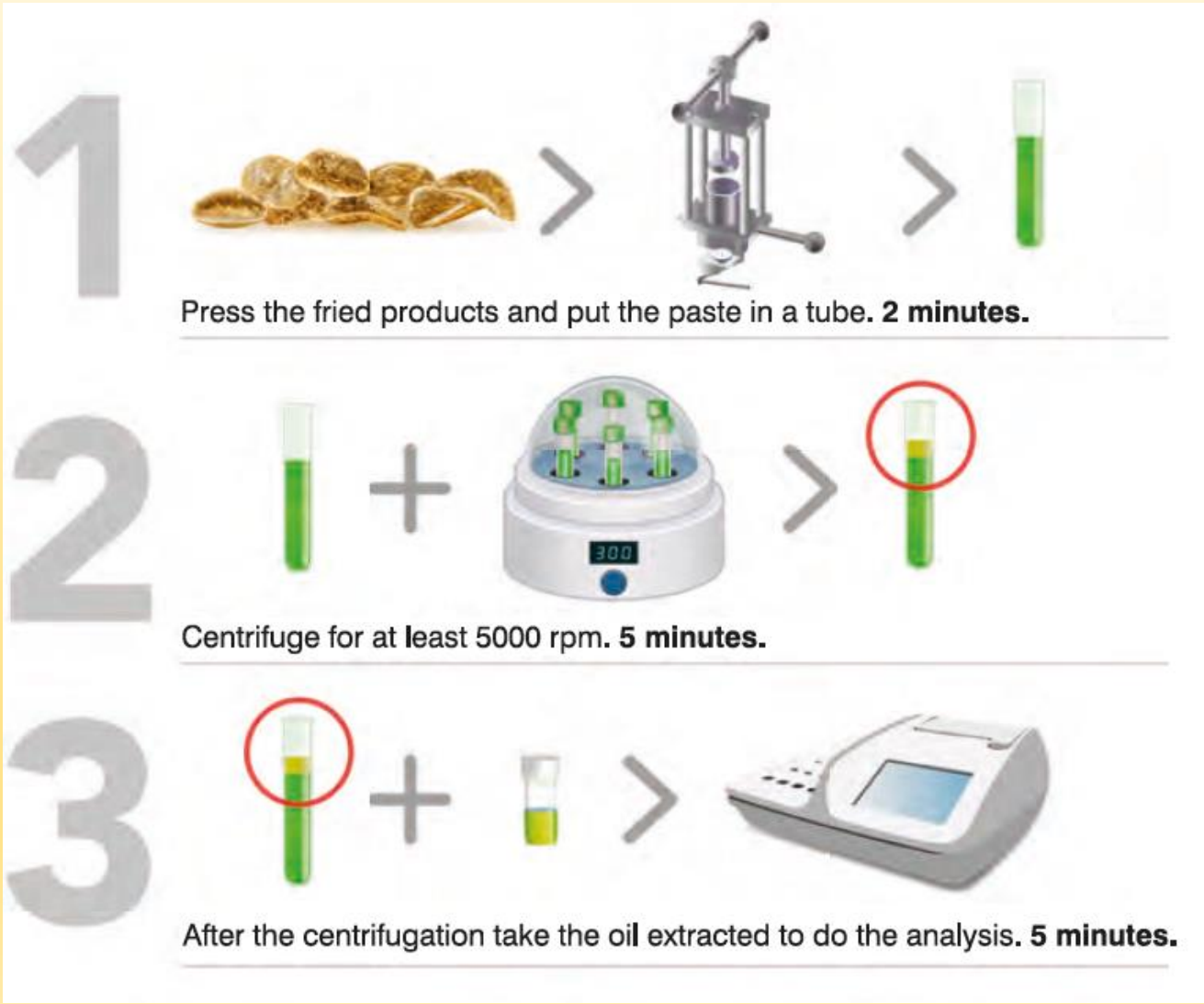
Analisis of **snacks** with CDR FoodLab®

With the **CDR FoodPress** we can easily and quickly extract the oil from the solid sample

After a short centrifugation we take the the sample and we can carry out all the analysis (FFA, PV and AnV)



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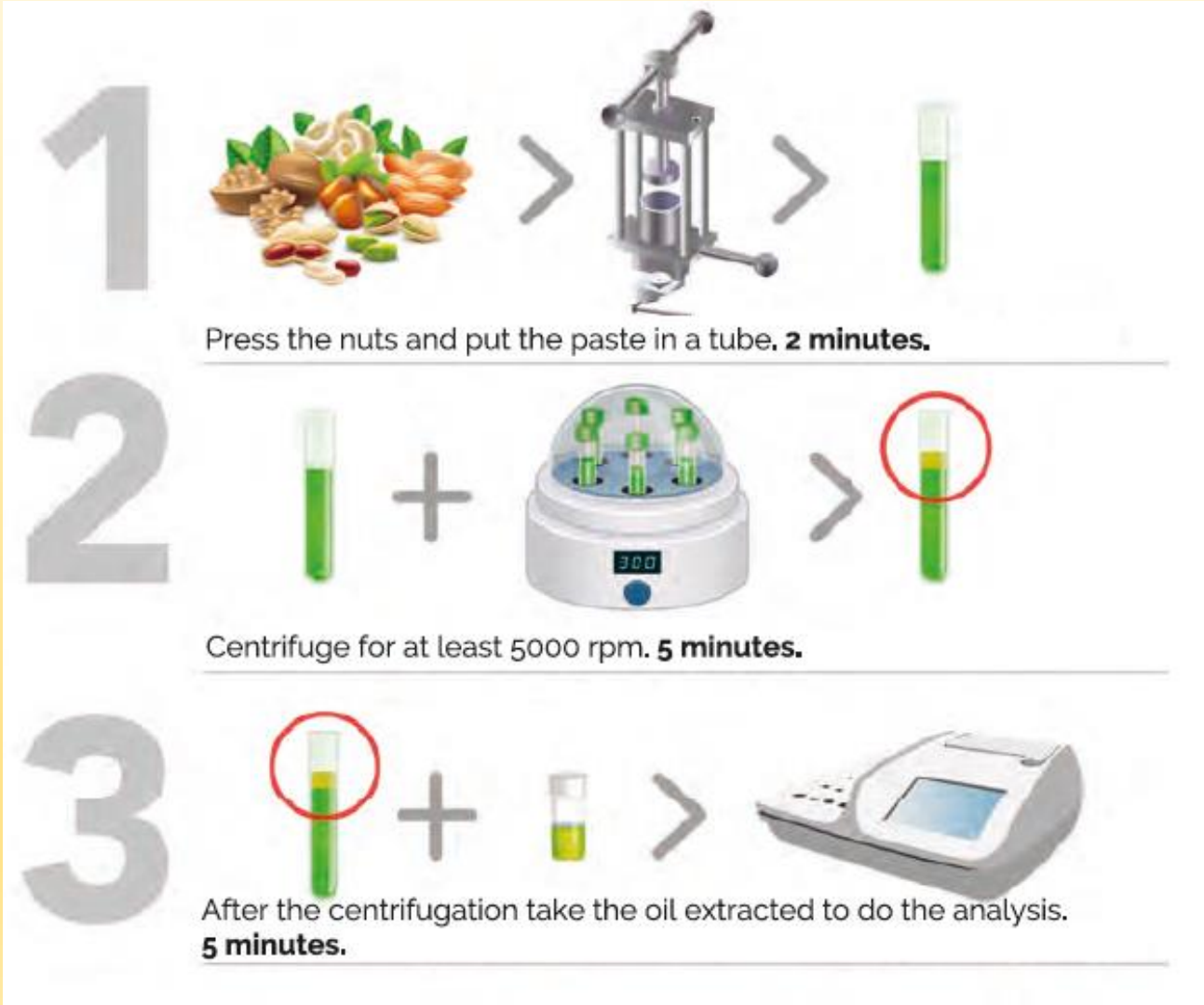
Analisis on **nuts and hard shelled fruits** with CDR FoodLab®

With the **CDR FoodPress** we can easily and quickly extract the oil from the solid sample

After a short centrifugation we take the the sample and we can carry out all the analysis (FFA, PV and AnV)



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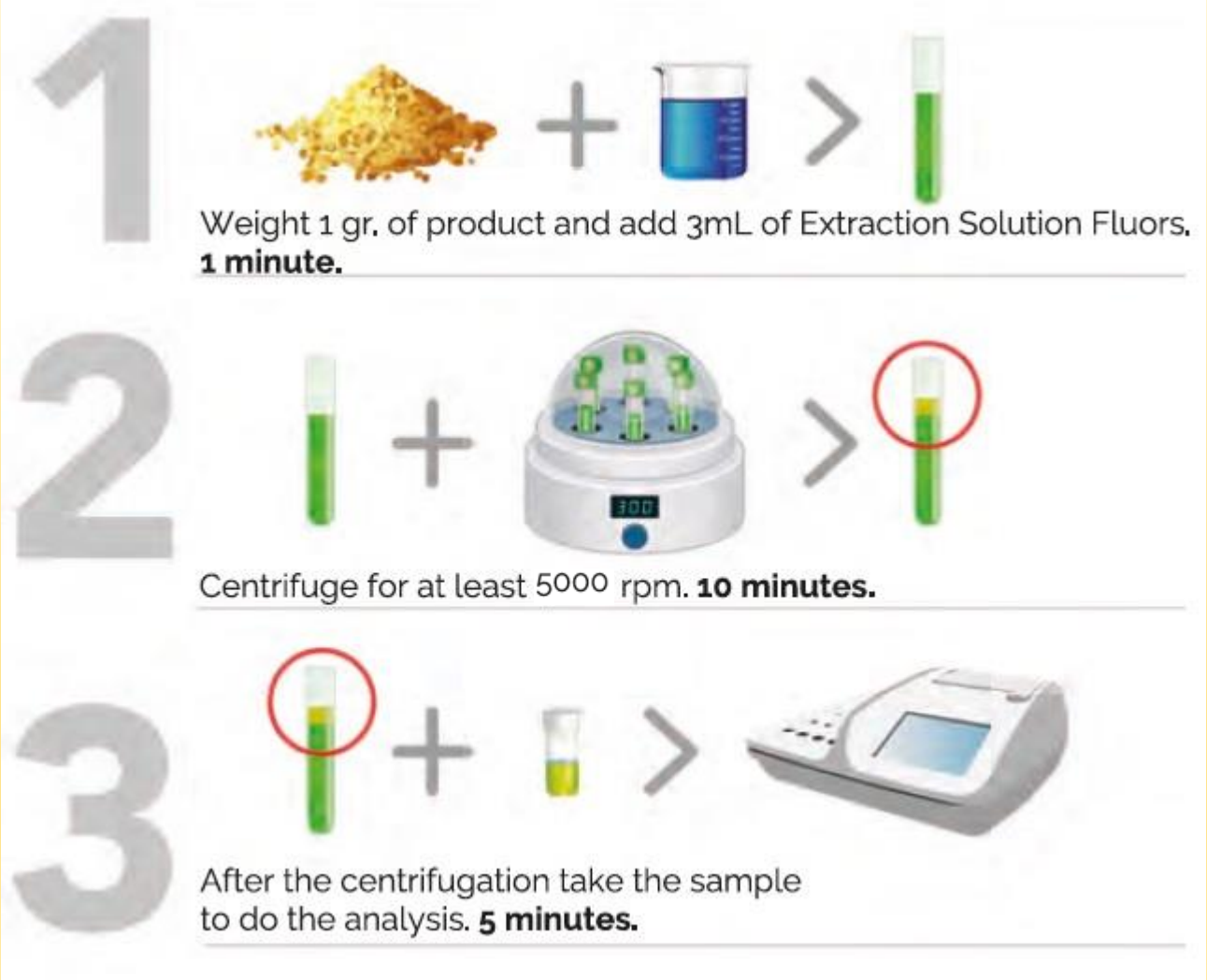
Analisis of **flour** with CDR FoodLab®

The **flour** is treated with a specific extraction solution to extract the fat from the solid sample

In this case CDR FoodLab® need the **Fat %** so that at the end the results of FFA, PV and AnV are recalculated automatically by the analyzer



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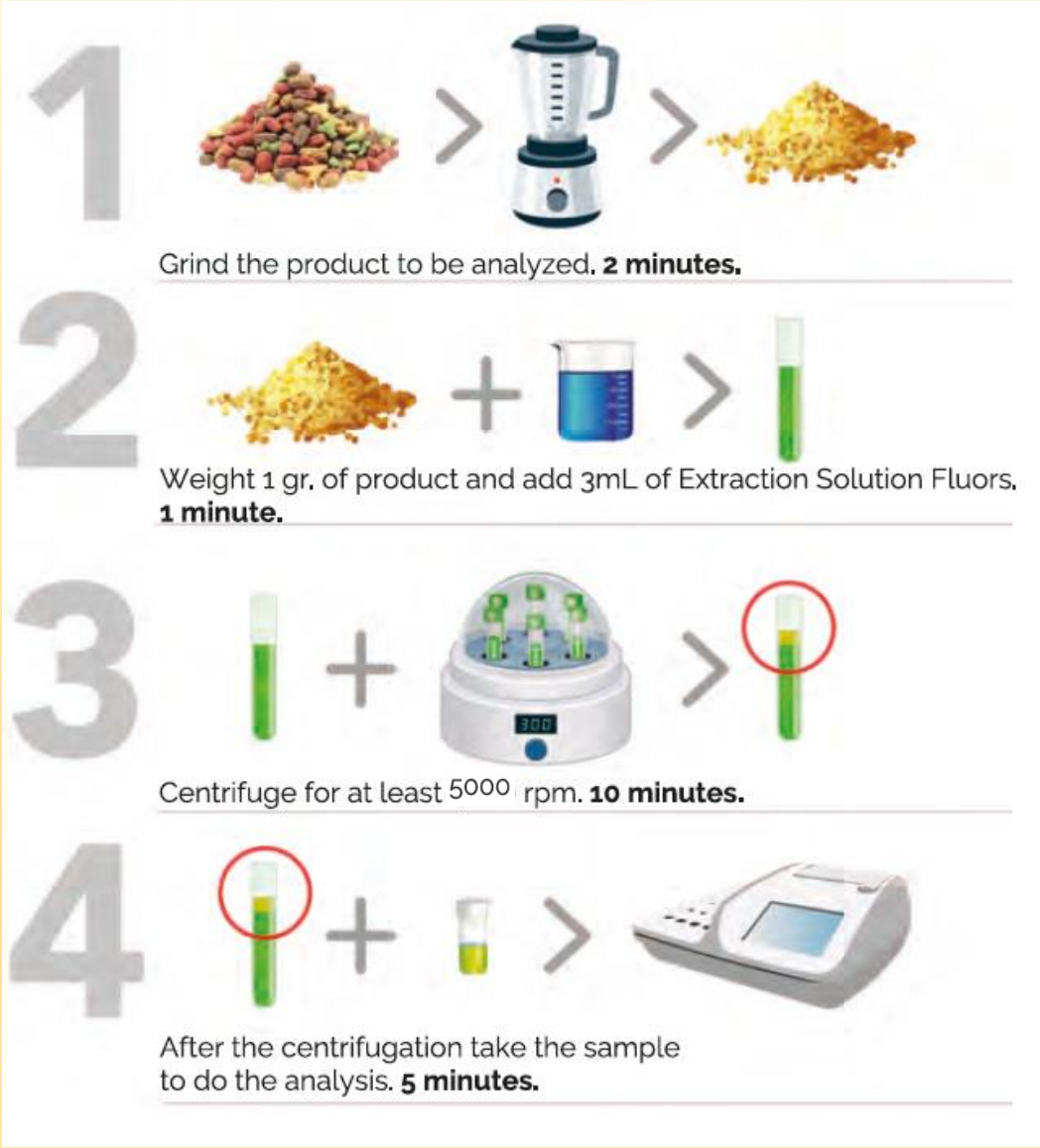
Analisis of **pet food** with CDR FoodLab®

Pet Food has to be grinded to get a flour. After that with a specific extraction solution we extract the fat from the solid sample

In this case CDR FoodLab® need the **Fat %** so that at the end the results of FFA, PV and AnV are recalculated automatically by the analyzer



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Thank you everyone!

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Simone Bellassai
CDR FOODLAB division manager