

馬來西亞與台灣  
生乳檢測科技 研討會  
Analytical Technology in  
Raw Milk –  
Malaysia and Taiwan

## 固態及液態乳製品檢測新儀器 New Analytical Instruments for Liquid and Solid Dairy Products

TLRI, Miaoli, Taiwan, 20th Nov. 2018

孫丕忠 Terence Sun



## 固態及液態乳製品 快速檢測分析儀 Rapid Analyzers for Liquid & Solid Dairy Products

**FOSS**



多功能液態乳製品成分分析儀  
MilkoScan™ FT 1



生乳總生菌數及體細胞分析儀  
BacSomatic™



固態乳製品成分分析儀  
FoodScan™ 2

Dedicated Analytical!

## 多功能液態乳製品成分分析儀 MilkoScan FT 1

**FOSS**

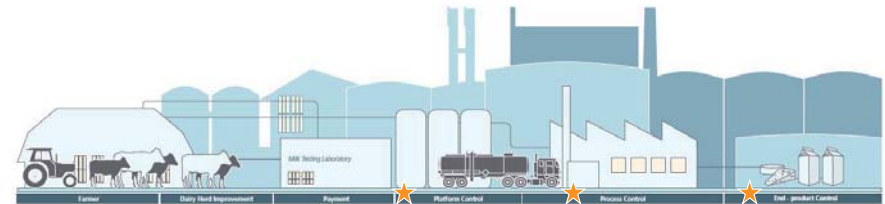
The new MilkoScan™ FT 1 is the ideal solution for dairies requiring easy, fast and reliable milk analysis



Dedicated Analytical Solutions

## Where to use the MilkoScan FT 1

**FOSS**



### Accurate Compositional analysis of milk

- 收乳平台 Platform control
  - For payment reasons
  - For screening against adulteration
  - For masse balance calculation
- 製程標準化 Milk standardisation
  - For optimising the raw material cost
  - For obtaining consistence products
- 產品檢測 End product consumer milk
  - For verification reasons



牛乳檢測項目  
Milk parameters

Fat, Protein, Lactose, Low Lactose, Total Solids, SNF, FPD, Total Acidity, Density, FFA, Citric acids, Urea, Glucose, Galatose

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簡單三步驟

1. Load



2. Start



3. Get the result in 30 seconds



FTIR 檢測技術

Purpose built FTIR unit

- FT-IR provides the full spectrum
- Accurate results
- Good repeatability and sensitivity

自動清洗及歸零

Automatic clean and zero module

- Faster single sample analysis
- Less operator time spent on cleaning
- The operator from production may walk right up to the instrument and leave after 30 seconds



樣品溫度 5 - 55° C

Sample temperature 5 - 55° C

- Direct analysis of cold samples
- Faster analysis of **homogeneous** samples
- No time spent on sample pre-treatment

標準化

Standardisation

- Instruments gives the same results regardless
- cuvette wear.
- Only small S& I adjustments after cuvette change

分析時間 30秒

Fast results

- For milk analysis 30 sec.

符合 IDF 141 規範

- In compliance with IDF 141

分析光譜自動儲存  
Spectra automatically saved

- Saves time as it is not necessary to remember to analyse special
- Possible to add old sample to a sample set.

樣品重測功能  
Reprediction of samples

- Operators do not need to re-analyse samples if they have choose the wrong product - Save time.
- Test which calibration fits the product best.

異常樣品偵測 GH  
Outlier detection GH

- Get a warning if something is wrong with the product being analysed. This means avoiding standardizing an tank of milk with a bad sample (outlier) When starting up – It is possible to tests which product fits best and test if a new PL5 calibration is necessary

自 FT 120 轉移檢量線  
Transfer of FT 120 calibration

- It is possible to use your old MSC FT120 calibration on the MSC FT1. No need to develop new once.

改良式先導樣品控制圖 IDF 141C  
Improved Pilot sample graph and tools - According to IDF 141C

- The new graph ensures the instrument is according to IDF 141 C and helps monitoring that the instrument is working ok.
- Avoid analysing on a bad instrument

斜率/截距修正建議及警示  
Slope and Intercept recommendation /warning in color

- GH on slope and intercept – do your samples fit the calibration ? Avoid using poor a calibration which can cause bad products quality and ruin the brand as well as give bad economy

操作簡單之自建檢量線軟體  
New and easy calibration software

- The software is specially design for the MSC FT1 and guide you though the calibration work. Possible to use the full spectrum which means almost all organic components can be calibration for (if present in high enough in concentration)



設備規格 Specifications / tech news



Built on the well proven analytical technology behind the renowned MilkoScan FT120, and with easy and simple software the MilkoScan FT1 offers the very latest in liquid milk testing.

特點 Feature	規格 Spec
準確度 Accuracy	≤1% CV on major milk components (Fat, Protein, Lactose, Total Solids)
再現性 Repeatability	≤ 0.25 % CV on milk on major milk components (Fat, Protein, Lactose, Total Solids)
校正軟體 Calibration software	Slope & Intercept and ASM, Calibration development software
自 FT 120 轉移檢量線 Transfer of FT 120 or FT2 customer developed calibrations	Calibrations can be transferred from MilkoScan FT120
網路 Network connection	LIMS/ Mosaic

## 可測樣品種類 What kind of products can be use for **FOSS**

### 可測樣品種類 What kind of products can be use for ?

- ▶ 生乳 Raw Milk
- ▶ 鮮乳 Fresh Milk
- ▶ 調味乳 Flavored Milk
- ▶ 配方強化乳 Infant Formula
- ▶ 咖啡牛奶 Coffee Milk
- ▶ 豆漿 Soya Milk
- ▶ 優酪乳 Yoghurt
- ▶ 發酵乳製品 Fermented Products
- ▶ 濃縮乳 Concentrated Milk
- ▶ 奶油 Cream
- ▶ 乳清 Whey
- ▶ 冰淇淋 Ice Cream
- ▶ 醬油 Soya Sauce

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## 可測項目 A broader range of robust calibrations **FOSS**

### Quality Components

Total Acids  
Citric acids  
Density  
Freezing Point depression  
Free Fatty Acids  
Urea

### 牛乳檢測項目 Milk Parameters

15 standard milk components  
All included with the MilkoScan FT1  
+ ASM Module

### Mass Balance/Standardization/Payment

Fat,  
Protein,  
Casein  
Lactose,  
Total Solids  
Solids non Fat

### End Product Control

Low Lactose  
Glucose  
Galactose

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## Calibration packages **FOSS**



### 基本檢量線 Included with the instrument

- Milk; (F, P, L, LL, TS, SNF, CA, FPD, DEN, TA, FFA, CAS, U, Gluc, Gal)
- Cream ; (F, P, L, TS, SNF)
- Whey ; (F, P, L, TS)
- Yoghurt & Ice Cream (Basic); (F, P, TS)



### Dessert & Ice Cream

- Dessert & Ice Cream Calibration (F, P, L, GLU, SUC, FRU, TSU, TS)
- Desserts & Flavored Milks with Vegetables fat (F, P, TS)



### Fortified Milk & Whey Applications

- Concentrated Milk ; (F, TS, SNF)
- Infant Formula ; ( (F, TS, SNF)
- UF Whey ; (P, TS)
- Evaporated Whey; (P, TS, AC, L-AC)



### Yoghurt & Fermented Applications

- Yoghurt/Fermented Products ; (F, P, L, GLU, SUC, TSU, SNF, TS, FRU, LA)
- Quark; (F, P, TS)

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## FOSS

### 固態及半固態乳製品 快速分析儀

### FoodScan™ 2 for Solid Dairy Products



There's more to know

ANALYTICS BEYOND MEASURE



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固態及半固態乳製品快速分析儀  
FOODSCAN™ 2 FOR SOLID DAIRY PRODUCT ANALYSIS

FOSS

FoodScan™ 2  
A VARIANT TO SUIT YOUR NEEDS



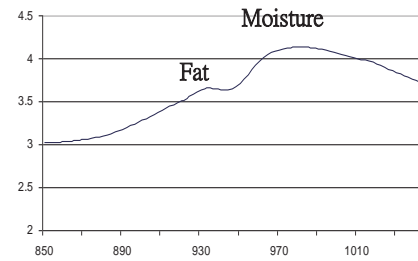
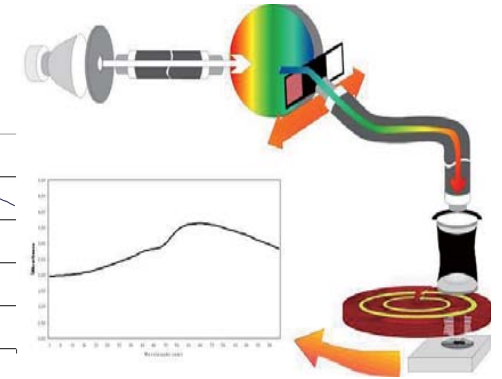
FoodScan 2 is the optimum solution for rapid routine NIR transmission analysis of solid and semi-solid products like butter, cheese, yoghurt and quark

ANALYTICS BEYOND MEASURE

檢測原理 FOODSCAN - OPERATING PRINCIPLE

FOSS

- NIR Transmittance 850-1050 nm on a rotating sample
- 1-40 sub samples / 3 sub scan
- 15-60 seconds



ANALYTICS BEYOND MEASURE

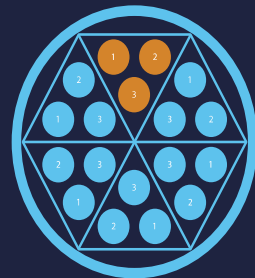
WE CAN'T REMOVE SAMPLE PREPARATION...

But we can give you more options:

- Optimise your sample preparation protocols and achieve same accuracy with a faster preparation
- Keep your current sample preparation protocols and achieve greater precision

"FoodScan™ 2 field trials in US show that you do not need to compromise on accuracy when analyzing on whole curd versus ground curd....that saves a lot of sample preparation..."

THERE'S MORE TO KNOW ABOUT EVERY SAMPLE



Accurate results every time because:

- With 3 sub-scans an even larger share of the sample is measured, which make you less dependent on the homogenisation step
- FoodScan™ 2 is a major step forward in NIR transmission technology

A DEDICATED SOLUTION FOR ANALYSIS OF SOLID AND SEMI-SOLID DAIRY PRODUCTS

FoodScan™ has enabled efficient quality control of fat, protein, salt, moisture and total solids in cheese, butter, spreads, fermented and cultured products.

Anyone in production and the lab can operate a FoodScan and access the knowledge that can improve quality and consistency of end-products and optimize the production process.

CHEESE PRODUCTION



Process control



Final product control

BUTTER PRODUCTION



Process control



Final product control

## EVEN EASIER TO USE! FAST AND INTUITIVE OPERATION

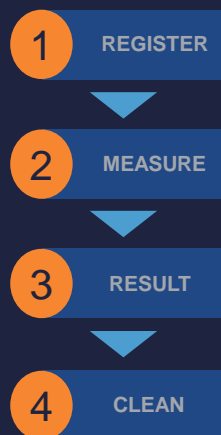
The right analyser is not enough. To ensure products are always made to spec you also need to continuously rely on your operators' skills.

In a busy environment you need to ensure that operations run as smoothly as possible.

*"Really easy to tell the results whether being specific sample screens or historic sample overview."*

*Field test user  
North America*

AN OPERATOR CAN BE TRAINED TO USE IT IN JUST 2 MINUTES!



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REGISTER

MEASURE

RESULT

CLEAN



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## TIME TO RESULT REDUCED BY UP TO 60%

The demand for greater efficiency grows as dairy plants increase throughput and introduce new end-products to stay competitive and meet changing consumer preferences. This adds to the work-load in the QA laboratory.

Faster analysis time enables the QA lab to do more with the same resources.



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ANALYSIS TIME CAN BE AS FAST AS 15 SECONDS

ANALYTICS BEYOND MEASURE

## READY TO USE CALIBRATIONS - ALSO WHEN INTRODUCING NEW PRODUCT TYPES

Change is inevitable. Raw materials change. Production processes change. Consumer trends change and new products are introduced.

The intelligence and robustness of the ANN calibrations ensure you're well equipped to deal with it all!

If you need to control parameters or products that are not covered by the ANN calibrations, we can support you with the tools and competences required to make customised models.



There's more to know with calibrations based on 30,000 reference samples.

FoodScan's ANN calibration covers a wide range of solid and semi-solid dairy products



CHEESE  
BUTTER  
SPREADS

CULTURED AND FERMENTED PRODUCTS

WHEY POWDER

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## A VARIANT TO SUIT YOUR NEEDS

# FoodScan™ 2 PRO

- With touchscreen and inbuilt PC
- IP65 classification
- For use at-line in production environment

### SAMPLE & PARAMETERS

**CHEESE** - Global ANN calibrations for Fat, Moisture, Protein, Salt and Total solids in Cheese - PLS calibrations for Saturated Fatty Acids in Cheese

**BUTTER & SPREADS** - Global ANN calibrations for Fat, Moisture, Salt, Solids non-fat and Total solids

**CULTURED AND FERMENTED PRODUCTS** (Yoghurt, Fresh and Cream cheese as well as Cream products) - Global ANN calibrations for Fat, Moisture, Protein and Total solids - PLS calibrations for pH in Fermented products



### WHAT'S IN THE BOX?

FoodScan™ 2 Pro Dairy Analyser  
1 Sample cup large  
1 Sample cup medium  
1 Cup holder  
Free FossConnect subscription  
Guides and manuals  
ISIScan Nova software package (USB)

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## A VARIANT TO SUIT YOUR NEEDS

# FoodScan™ 2 LAB TS

- With touchscreen and inbuilt PC
- For use in laboratory or in protected environment

### SAMPLE & PARAMETERS

**CHEESE** - Global ANN calibrations for Fat, Moisture, Protein, Salt and Total solids in Cheese - PLS calibrations for Saturated Fatty Acids in Cheese

**BUTTER & SPREADS** - Global ANN calibrations for Fat, Moisture, Salt, Solids non-fat and Total solids

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Guides and manuals  
ISIScan Nova software package (USB)

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## A VARIANT TO SUIT YOUR NEEDS

# FoodScan™ 2 LAB

- Operated through an external standard PC with the FoodScan™ 2 software application
- For use in laboratory or in protected environment

### SAMPLE & PARAMETERS

**CHEESE** - Global ANN calibrations for Fat, Moisture, Protein, Salt and Total solids in Cheese - PLS calibrations for Saturated Fatty Acids in Cheese

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## MEASURE COLOUR AND COMPOSITION SIMULTANEOUSLY

The impact of colour on consumer preference has increased steadily over the last 10 years. Colour is now strongly associated with product quality.



- The colour module is one of the new features available with FoodScan™ 2
- Colour is measured with the CIE L\* a\* b standard
- The colour measurement is done at the same time as the composition parameters are measured

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NOW THE BEST IS EVEN BETTER!  
THERE'S MORE TO KNOW WITH  
FoodScan™ 2

- **TIME TO RESULT** reduced by up to 60%
- Delivers **ACCURATE RESULTS** – even with less homogenous samples
- **READY TO USE** calibrations – also when introducing new product types
- **MEASURE COLOUR** and composition at the same time
- Even **EASIER TO USE!** Fast and intuitive operation
- Maintain **TOP PERFORMANCE** with digital services
- **EXCELLENT TRANSFERABILITY** between analyzers



生乳 總生菌數及體細胞快速分析儀  
BACSOMATIC™ RAPID HYGIENE TESTS FOR EVERYONE

FOSS



THE POWER OF THE CENTRAL LAB IN A BOX

FOSS



THE CONCEPT BEHIND BACSOMATIC?

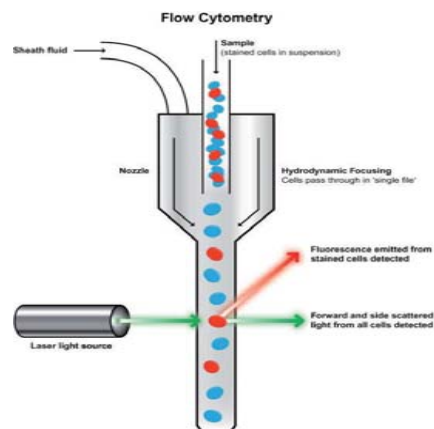
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<p>2 <b>IN</b> 1</p>		<p>It's the first-ever integrated bacteria and somatic cell tester</p> <p>It's more accurate than alternative methods</p> <p>It's as simple to use as a MilkoScan</p>
<p>A unique opportunity to strengthen raw material control for quality and cost management</p>	<p>Smoother operations by combining <b>IBC and SCC analysis in one</b>, user-friendly solution with a fast return on investment</p>	

## 檢測原理 MEASURING SYSTEM

FOSS

- ▶ Based in **Flow Cytometry**
- ▶ Bacteria and somatic cells are stained with a fluorescent dye
- ▶ Injected into the Flow Cell in a single file
- ▶ Laser intercept cell in flow cell
- ▶ Detector converts the light emitted into electronic signal
- ▶ IBC and SCC count is shown in the display



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## BACSOMATIC

### ADDING VALUE IN THE SUPPLY CHAIN

FOSS



#### Bigger farms:

Hygienic quality check  
Health of cows (mastitis)  
Transportation and handling

#### Smaller analytical labs:

Dairy herd improvement and payment analysis

#### Any dairy:

Payment from dairy to farmer  
Milk quality check at dairy receival bay  
High-end product quality

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FOSS

An easy to use instrument for analyzing bacteria cell count and somatic cell count at the same time

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## 操作流程 BACSOMATIC WORKFLOW

FOSS



**Present sample**  
Bacteria and somatic cell counting – as simple as a Milkoscan



**Enter sample ID**  
Press start



**Test**  
Up to 4 milk samples for bacteria count can be incubated at a time

IBC	SCC
6.70	87.1
8.20	91.0
11.9	85.6


**Read result**  
IBC in 9.5 min  
SCC in 1.5 min

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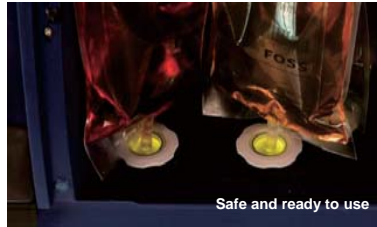


## MORE ACCURATE THEN THE ALTERNATIVES


FOSS



Closed reagent system



Safe and ready to use



Bag sensors

Ready-to-use reagents in safe, enclosed bag system

Automated procedure ensures exact reagent dosage every time reducing the risk of human error that can occur with other methods

Eliminates the need for reagent mixing, reducing risk of error and providing highly consistent results

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ANALYTICS BEYOND MEASURE

## SIMPLE AND FLEXIBLE

FOSS

### The software user interface includes:

- Touch screen - no external or internal PC required
- Visual guides
- Easy export of results to spreadsheet
- Graphical interface for service operations
- Barcode reader for sample ID
- Remote monitoring of instrument performance and remote support facilities

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ANALYTICS BEYOND MEASURE

## 設備規格 KEY PERFORMANCE SPECS

FOSS

PERFORMANCE SPECS	
Measured components	Individual Bacteria Count (IBC) and Total Somatic Cells (SCC)
Sample type	Raw Milk from cows
Analysis capacity	SCC and IBC: 15 samples/hr Only IBC: 15 samples/hr Only SCC: 40 samples/hr
Carry over	<1% relative, usually <0.5%
Sample intake volume	SCC and IBC: 7.2 ml IBC Only: 6.4 ml SCC Only: 2.5 ml
Sample temperature	2-4 Deg. C
Working factor	IBC: 100 SCC: 100

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ANALYTICS BEYOND MEASURE

## 設備規格 KEY PERFORMANCE SPECS

FOSS

PERFORMANCE SPECS	
Measuring range:	IBC: 5.000-20 mln IBC/ml SCC: 0-10 mln cells/ml
Performance range:	IBC: 10.000-10 mln IBC/ml SCC: 100.000 – 1.5 mln cells/ml
Repeatability IBC:	Sr≤0.07 log rel, at 10,000 – 50,000 IBC/ml Sr≤0.05 log rel, at 51,000 – 200,000 IBC/ml Sr≤0.04 log rel, at >200,000 IBC/ml
Repeatability SCC:	CV<6% at 100,000 cells/ml CV<4% at 300,000 cells/ml CV<3% at 500,000 cells/ml
Accuracy IBC:	Typical Sy,x <0.25 log units from SPC (plate counting) 2-4 Deg. C
Accuracy SCC:	<10% relative mean diff from DMSCC

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ANALYTICS BEYOND MEASURE

## THE BACSOMATIC SOLUTION

- Improve hygiene on the farm
- Improve health and productivity of dairy herds
- Make better use of raw materials in the dairy
- Avoid low quality products
- Save time in the lab and dairy
- Save disposables
- Save equipment costs with one integrated solution



ANALYTICS BEYOND MEASURE



The first-ever integrated bacteria and somatic cell tester  
More accurate than alternative methods  
Simple and flexible to use

# THANK YOU

ANALYTICS BEYOND MEASURE