PROCEEDINGS

1° CONVEGNO ANALISI LATTIERO-CASEARIE

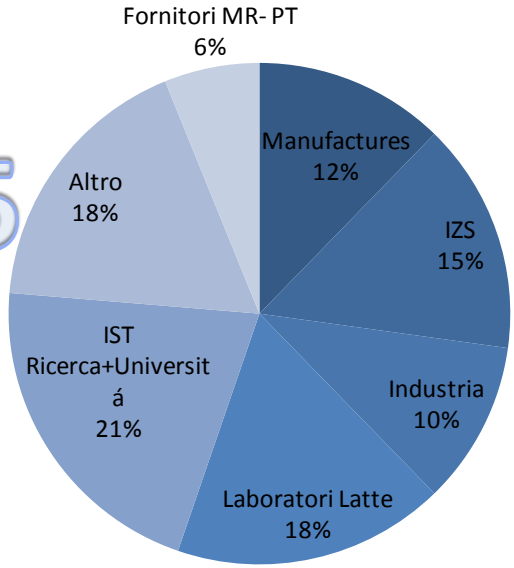
AEOS – RUMINANTIA

ROMA 23-24 MARZO 2017

Partecipanti 2017

Presente e Futuro delle potenzialitá offerte dai parametri analitici del latte

n°115



BENTLEY INSTRUMENTS

GOLD SPONSOR

FOSS

PROGNOSIS BIOTECH

OR SELL SRL
CONTROLLA GLI ALIMENTI

PARMIGIANO REGGIANO

SILVER SPONSOR

CHR HANSEN
Improving food & health

ENEA

Agenzia nazionale per le nuove tecnologie,
l'energia e lo sviluppo economico sostenibile

UNI ENTE ITALIANO DI NORMAZIONE

DAIRY PRODUCTION MEDICINE DPM

PATROCINIO

ICAR THE GLOBAL STANDARD FOR LIVESTOCK DATA

S.I.B. Società Italiana Buiatria

FIL IDF Fédération Internationale du Lait • International Dairy Federation

ITALIA

AEOS
Analytical Equivalence

Consulenza nel settore lattiero caseario

Orlandini Silvia

laemme group

PARMIGIANO REGGIANO

EFSA PANEL
CONTAM (Observer)

Sotto Commissione
UNI Latte & derivati

ISO IDF
SC SA-AMAC-AMC-AHW

EU JRC

ICAR
MA SC

mpr

Qlip
quality assurance in agrofood

ICAR

AEOS
Analytical Equivalence

RUMINANTIA®
Libero confronto d'idee

Programma

Programma del convegno

Giovedì 23 Marzo

09:00-10:30	**Registrazione partecipanti**
10:30-11:00	Silvia Orlandini, Aeos, e Alessandro Fantini, Ruminantia: *Presentazione Convegno.*
11:00-11:20	Silvia Orlandini, Aeos: *Presentazione ISO ed IDF.*
11:20-11:40	Giovanna Contarini, presidente della sottocommissione UNI "Latte e derivati" – CREA-FLC, Lodi: *L'attività dell'UNI nella normazione del settore lattiero caseario.*
11:40-12:00	Martin Burke, ICAR CEO: *Presentazione ICAR e servizi offerti per i laboratori di analisi latte.*
12:00-12:15	Pierre Broutin, Direttore Bentley Europe: *Modello di Calibrazione FT-IR per la determinazione della chetosi.*
12:15-12:30	Daniel Schwarz, Foss: *La conta differenziale delle cellule somatiche con metodo a citometria di flusso nel latte vaccino.*
12:30-12:45	Georgios Papageorgiou, Prognosis Biotech-Orsell: *Nuovi approcci nella preparazione del campione per la quantificazione di Aflatossina M1 nei derivati del latte.*
13:00-14:30	Pranzo
14:30-14:50	Giovanna Zappa, ENEA: *Presentazione progetto METRO*
14:50-15:10	Silvia Orlandini, ICAR: *ICAR Proficiency test e Certificazioni ICAR.*
15:10-15:30	Silvia Orlandini, AEOS: *Principali progetti di standardizzazione analitica dei comitati ISO/IDF/ICAR e riferibilitá analitica nel settore lattiero caseario.*
15:30-16:00	Discussione
16:00-16:30	Coffee Break
16:30-16:50	Martin Burke, ICAR CEO: *Esperienza utilizzo data base Irlandese.*
16:50-17:10	Sophia Mast, AiM: *Determinazione degli antibiotici nel latte crudo indicazioni legislative e nuove tecnologie in Germania.*
17:10-18:00	Discussione

Venerdì 24 Marzo

8:30-9:00	Alessandro Fantini, Ruminantia: Welfare Biomarkers Milk.
9:00-9:20	Fabiola Canavesi, Animal Breeding Consulting: Potenzialitá offerte dalla tecnologia FT- IR ai fini della selezione genomica.
9:20-9:40	Prof. Nicoló Pietro Paolo Macciotta, Universitá degli Studi di Sassari Scienze agrarie e veterinarie: *Tecniche analitiche e statistiche per il miglioramento genetico della pecora sarda.*
9.40-10.00	Discussione
10:00-10:20	Marco Nocetti, Consorzio del Parmigiano-Reggiano: Tecniche analitiche innovative per la caratterizzazione del
10:20-10:40	Nicola Cologna, Concast: La filiera Trentingrana Concast: il controllo del latte nella provincia di Trento.
10:40-11:00	Discussione
11:00-11:30	Coffee Break
11:30-11:50	Gilberto Giangolini, Ist. Zooprofilattico di Lazio e Toscana, Centro di Referenza latte Ovino: Latte ovino e caprino: limite di conformità per la fosfatasi alcalina e aggiornamento della tabella di conversione per la Carica Batterica Totale.
11:50-12:10	Annamaria Ferrini, Responsabile LNR per il latte e i prodotti a base di latte, Istituto Superiore di Sanità: strategie analitiche per la ricerca di residui di antibiotici nel latte.
12.10-12:30	Giuseppe Bolzoni, Ist. Zooprofilattico di Brescia, Centro di Referenza latte Bovino: Pro e Contro di una tabella di conversione Impulsi/Unitá Formanti Colonie.
12:30-13:00	Discussione e conclusione Lavori.
14:30-16:00	Discussione delle tematiche affrontate e presentazione network di contatti.

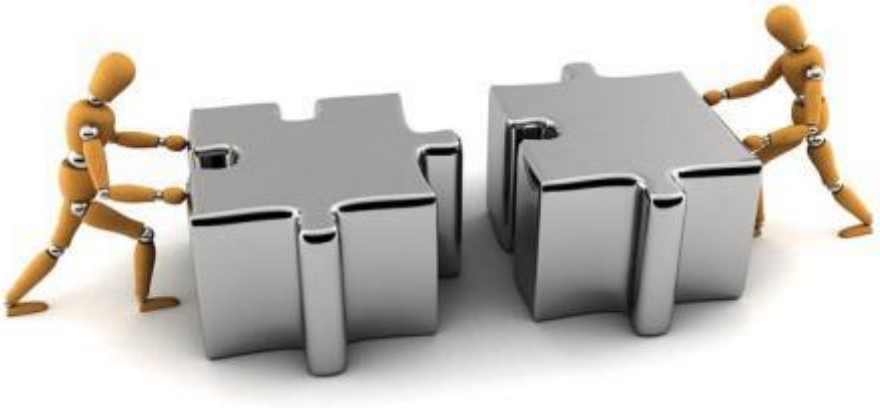
ISO/IDF Cooperazione
Metodi di analisi e campionamento per latte e derivati

Silvia Orlandini

Roma, 23.24 Marzo 2017

Missione

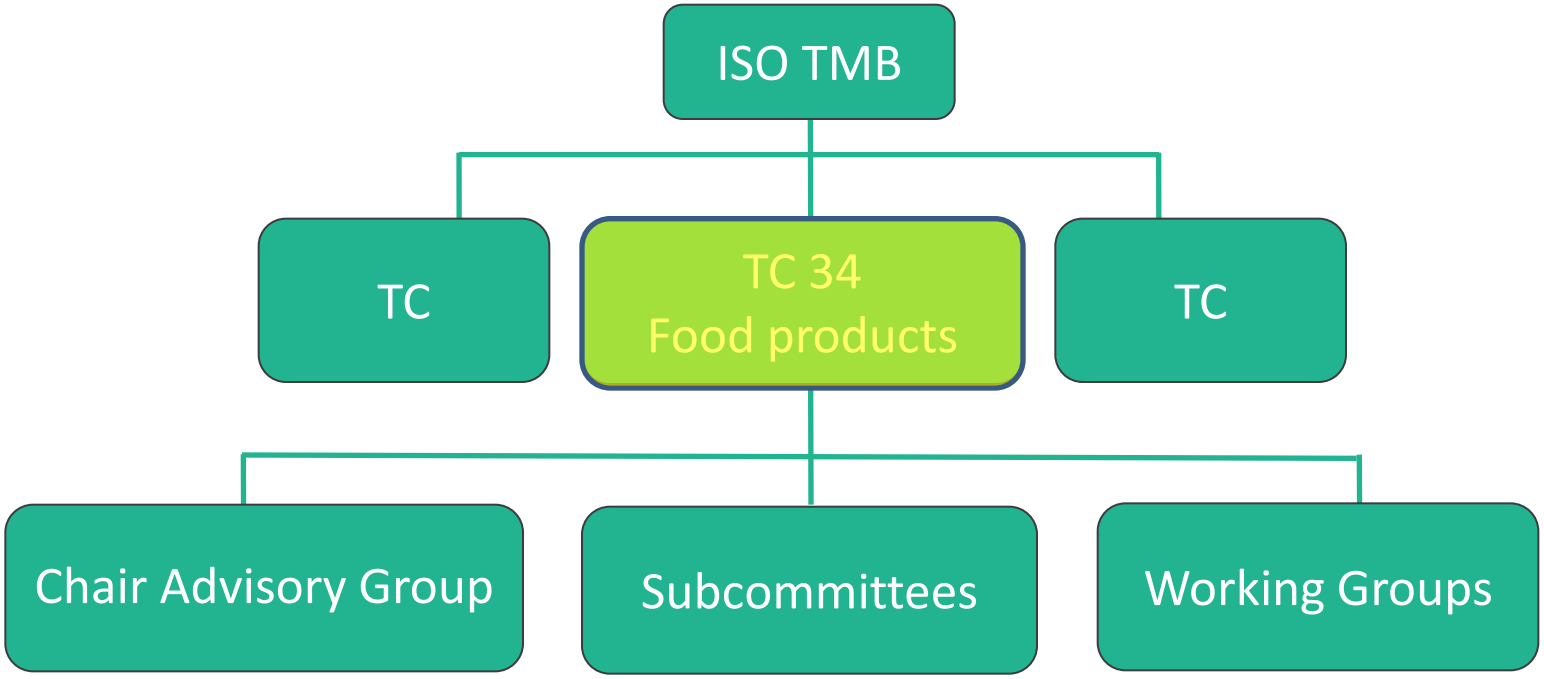
ISO sviluppo elevata qualitá di International Standards volontari per facilitare scambi internazionali di beni e servizi, supporta una crescita economica equa e sostenibile, promuove l'innovazione e protegge la salute, la sicurezza e l'ambiente



Principi chiave dello sviluppo di ISO Standards

- ISO standards rispondono alle necessitá del mercato
- ISO standards sono basati sull'opinione di esperti
- ISO standards son sviluppati attraverso il coinvolgimento di piú stakeholder
- ISO standards sono fondati sul consenso

Sviluppo di ISO Standards



TC 34 SubCommittees and Working Groups

SC 2	Oleaginous seeds and fruits and oilseed meals
SC 3	Fruit and vegetable products
SC 4	Cereals and pulses
SC 5	**Milk and milk products**
SC 6	Meat, poultry, fish, eggs and their products
SC 7	Spices, culinary herbs and condiments
SC 8	Tea
SC 9	**Microbiology**
SC 10	Animal feeding stuffs
SC 11	Animal and vegetable fats and oils
SC 12	Sensory analysis
SC 14	Fresh, dry and dried fruits and vegetables
SC 15	Coffee
SC 16	Horizontal methods for molecular biomarker analysis
SC 17	Management systems for food safety (DK)
WG 13	Royal jelly
WG 14	**Vitamins, carotenoids and other nutrients**
WG 16	Animal welfare
WG 17	Water activity
WG 18	Natural food ingredients

Importanza degli Standard Internazionali

INTERNATIONAL STANDARD

ISO 8968-1

IDF 20-1

Second edition
2014-02-01

Milk and milk products — Determination of nitrogen content —

Part 1:
Kjeldahl principle and crude protein calculation

Missione IDF

Aiutare a nutrire il mondo con sistemi di produzione lattiero caseari sostenibili fornendo un supporto scientifico condiviso. Vuole essere una voce unica del settore per le organizzazioni intergovernative e tutti gli addetti del settore

Standardizzazione nel settore lattiero caseario

La produzione, la trasformazione ed il commercio di prodotti lattiero caseari é una attivita globale. Di conseguenza esiste una reale domanda di standard credibili

- Sicurezza alimentare
- Produzione e trasformazione dei prodotti lattiero caseari
- Laboratori di analisi– ISO 17025
- Autoritá (Inter)nationali
- Codex Alimentarius

➔ISO – IDF cooperano per lo sviluppo di standard

Strategia IDF

Visione:
Aiutare a nutrire il mondo
con prodotti lattiero caseari salubri e sostenibili

Fornire informazioni scientifiche e condivise per il settore lattiero caseario ed essere una "voce globale" del settore a disposizione di organizzazioni governative internazionali (IGOs)

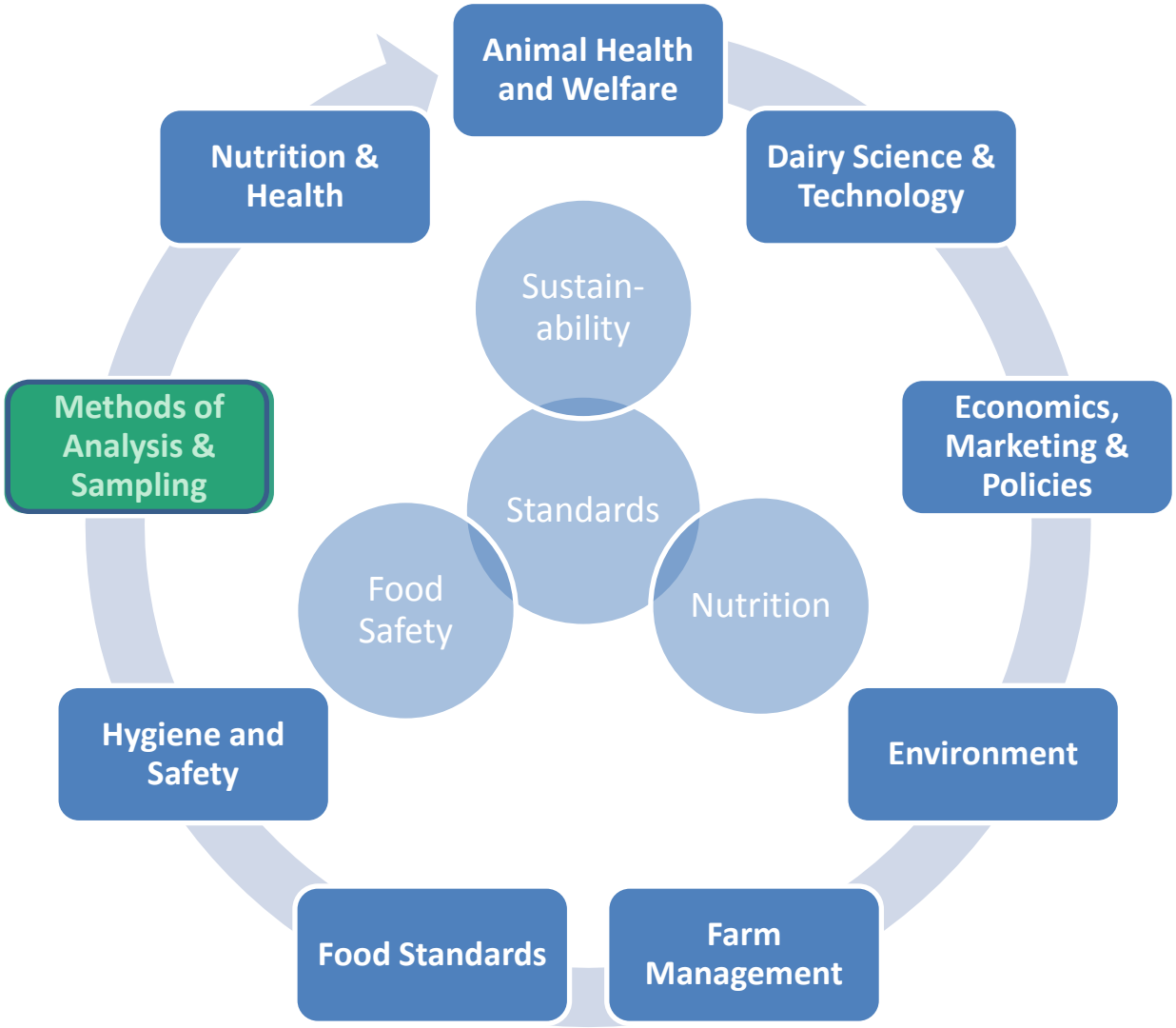
- Le IGOs supportano l'idea che i prodotti lattiero caseari siano essenziali per una dieta sana e per la sostenibilitá ambientale,
- IDF ha la capacitá di reagire rapidamente e di adattarsi ai cambiamenti

Sostenibilitá	Nutrizione	Qualitá & Salute (dairy)

Standardizzazione

Tale visione é applicata a tutti i lavori IDF

IDF aree di lavoro



Methods Standards Steering Group

Harrie van den Bijgaart
Chair (NL)

Aurélie Dubois-Lozier
IDF HO

Marcel de Vreeze
ISO/TC 34/SC 5 (NL)

Philippe Trossat (FR)

Richard Johnson (NZ)

Analytical Methods for Composition

Karin Kraehenbuehl (CH)
Valérie Gaudin (FR)

Analytical Methods for Additives & Contaminants

Jackie Page (US)

Charlotte Egger (CH)

Analytical Methods for Processing Aids & Indicators

Stéphane Chartier (FR)
Sandra Casani (DK)

Analytical Methods for Dairy Microorganisms

Barbara Gerten (DE)

Patricia Rollier (FR)

Harmonization of Microbiological Methods

Bianca Müller (DE)

Rob Crawford (NZ)

Statistics and Automation

Settimana Analitica

Schedule of the IDF/ISO Analytical Week 2016, 30 May – 3 June, Copenhagen, Denmark

	Sunday 29 May	Monday 30 May			Tuesday 31 May			Wednesday 1 June	Thursday 2 June			Friday 3 June	
8.30 – 10.30		8.30 – 9.30 Opening session			S11 S13	A10	C20 C21	Symposium	**SC AMC**	**SC HMM**	**SC AMAC**	**SCAM-PAI**	**SCSA**
	MSSG Members only 10-18	9.35 – 10-30 Chairs, deputy chairs and PLs					C25						
11.00 - 12.30		S01 S02	C19		S09		C32				A13		
		12.30 - 14.00 Lunch Break / Exhibition/Ad hoc PG meetings											
14.00 - 15.30	MSSG Members only	S12	C22 C41/ 42	P13	**SC AMDM**	S10	C14	Technical visit FOSS/Chr. Hansen	**SC AMC**	**SC HMM**	P08	MSSG (Members only) 13.00-15.00	
16.00 – 18.00		S03	C39 C17 C40	P05		S14	C33		*ICAR MASC*	**SC HMM**	S15		
		S16				Work-shop Emerg-ing contami tami-nants	C35						

~ 50 progetti di lavoro !

Pubblicazioni dall'ultima AW

ISO 16958|IDF 231 Milk products and infant formulae - Direct determination of fatty acid content – Capillary gas chromatographic method

ISO 20647|IDF 234 Infant formula and adult nutritionals -- Determination of total iodine by inductively coupled plasma mass spectrometry (ICP-MS)

ISO 20649|IDF 235 Infant formula and adult nutritionals -- Determination of chromium, selenium and molybdenum by inductively coupled plasma mass spectrometry (ICP-MS)

ISO 19344|IDF 232 Milk and milk products - Starter cultures, probiotics and fermented products - Quantification of lactic acid bacteria by flow cytometry

ISO 27105|IDF 216 Milk and cheese — Determination of hen's egg white lysozyme content by high performance liquid chromatography

EN-ISO 8968-4 | IDF 20-4 Milk and milk products — Determination of nitrogen content — Part 4: Determination of protein and non-protein nitrogen content and true protein content calculation (Reference method)

Pubblicazioni dall'ultima AW

Bulletin of the IDF No. 478/2015 - Interlaboratory collaborative study on a flow cytometry method for lactic acid bacteria quantification in starter cultures, probiotics and fermented milk products according to ISO 19344/IDF 232.

Bulletin of the IDF No. 482/2016 - Evaluation of nitrogen conversion factors for dairy and soy.

Golay, P-A., & Moulin, J. 2016. Determination of Labeled Fatty Acids Content in Milk Products, Infant Formula, and Adult/Pediatric Nutritional Formula by Capillary Gas Chromatography: Collaborative Study, Final Action 2012.13 J. AOAC Int. 99(1), pp 210-222.

Berger, T. & Luginbühl, W. 2016. Probabilistic comparison and assessment of proficiency testing schemes and laboratories in the somatic cell count of raw milk. Accred. Qual. Assur. 21(3), pp 175–183.

Liaisons

Obiettivo stragico: promuovere una arminizzazione globale nel settore lattiero caseario e dei relativi metodi di campionamento ed analisi

Conclusioni

- ISO & IDF
  hanno una eccellente reputazione come organizzazioni di standardizzazione

- IDF pone particolare attenzione a costruire collaborazioni con altre organizzazioni internazionali

Esempi:
AOAC SPIFAN (Stakeholder Panel for Infant Formula and Adult Nutritionals)
RSSCC (Reference System for Somatic Cell Counting)
ISO/IDF & USP (NPN)

Grazie per l’attenzione!

Key Principles in Supply Chain Management

- Effective communication

  Food businesses involved in the same food chain should establish effective communication with the other key players operating in the same chain.

- Appropriate food safety skills

  All players along the food chain should have and be able to demonstrate a general understanding of the nature and impact of all hazards that may occur at all stages in the food chain, and an in-depth understanding of those hazards that need be controlled at the step(s) for which they are responsible.

- Reliable suppliers

  Suppliers of products (ingredients or raw materials) and services should only be accepted by the receiving food business if they have been approved and/or recognized (certified or else) as being able to meet agreed outputs and/or to follow agreed procedures.

Key Principles in Supply Chain Management

- Shared responsibilities

  The individual food business responsible for a particular step in the food chain has the primary responsibility for meeting the requirements with regard to the safety of their products and services, when they are supplied to the subsequent step of the food chain.

- Supportive role of competent authorities

  Competent authorities should support cooperation between organizations through activities that encourage participation by companies and sectors.

Role of Analytics in Monitoring and Verification

- Fat profiling
- Nitrogen profiling
- Fourier Transform InfraRed fingerprinting
  - Targeted, i.e. calibration model for substance of interest
  - Non-targeted, i.e. abnormal milk screening
- Verification on Authenticity
  - Geographical origin
  - Production circumstances
  - Whole food (IR-like, PTR-MS like)
  - Components (fat, protein, elements, isotopes)

Conclusions

IDF creates value through leadership in global harmonization of standards to:

Protect consumer health

Facilitate dairy trade

L'attività dell'UNI nella normazione del settore lattiero caseario.

Giovanna Contarini - CREA-FLC Lodi

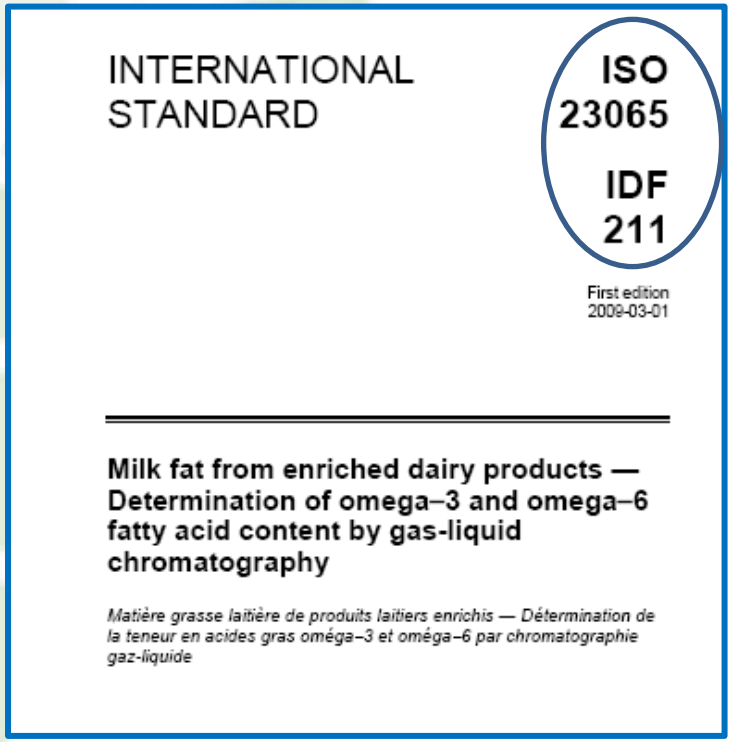
UNI - Ente Nazionale Italiano di Unificazione - è un'associazione privata senza scopo di lucro riconosciuta dallo Stato e dall'Unione Europea che da quasi 100 anni elabora e pubblica norme tecniche volontarie – le norme UNI – in tutti i settori industriali, commerciali e del terziario.

UNI rappresenta l'Italia presso le organizzazioni di normazione europea (CEN) e mondiale (ISO) e organizza la partecipazione delle delegazioni nazionali ai lavori di normazione sovranazionale

Sono soci UNI le imprese, i professionisti, le associazioni, gli enti pubblici, i centri di ricerca, gli istituti scolastici e accademici, le rappresentanze dei consumatori e dei lavoratori, il terzo settore e le organizzazione non governative, che insieme costituiscono una piattaforma multi-stakeholder di confronto tecnico unica a livello nazionale.

Fare normazione significa studiare, elaborare, approvare e pubblicare documenti di applicazione volontaria – le cosiddette norme tecniche – che definiscono come fare bene le cose garantendo sicurezza, qualità, rispetto per l'ambiente e prestazioni certe in tutti i settori industriali, commerciali e del terziario. Questo contribuisce all'efficienza del sistema socio-economico, fornendo gli strumenti di supporto all'innovazione tecnologica, alla competitività, alla protezione dei consumatori, alla tutela dell'ambiente, alla qualità di prodotti, servizi e processi.

Leggi e norme



INTERNATIONAL STANDARD

ISO 23065

IDF 211

First edition
2009-03-01

Milk fat from enriched dairy products — Determination of omega–3 and omega–6 fatty acid content by gas-liquid chromatography

Matière grasse laitière de produits laitiers enrichis — Détermination de la teneur en acides gras oméga–3 et oméga–6 par chromatographie gaz-liquide

Legge = norma secondo cui si regola la condotta degli uomini:

Norma = precetto, regola generale che prescrive la condotta da tenere

Il termine **norma ha due significati**: regola imperativa dell'ordinamento giuridico e regola convenuta di comune accordo. Il rapporto tra i due alimenta l'ambiguità fra leggi e norme, cogenza e volontarietà. Tra normazione e legislazione esiste un legame stretto: sebbene le norme tecniche siano volontarie, quando vengono richiamate nei provvedimenti legislativi si attiva una sinergia, che può arrivare fino a renderne l'uso obbligatorio.

Una **Norma** UNI fornisce regole, linee guida o caratteristiche per le attività o per i loro risultati, volte a raggiungere il grado ottimale di ordine in un dato contesto Oltre alle norme di prodotto, altri esempi includono: metodi di prova, codici di condotta, linee guida e sistemi di gestione.

Una **Specifica tecnica (TS)** si riferisce a lavori ancora in fase di sviluppo tecnico, o dove si ritiene che ci sarà un futuro, ma non immediata, possibilità di un accordo completo per arrivare ad una norma. Una specifica tecnica è pubblicata per l'uso immediato, ma fornisce anche un mezzo per ottenere un feedback.. Si presume che verrà poi trasformata e ripubblicata come una Norma

Un **Rapporto tecnico (TR)** è una relazione tecnica che contiene informazioni di tipo diverso dalla norma e dalla specifica tecnica. Può includere i dati ottenuti da un sondaggio, per esempio, o da un rapporto informativo, o le informazioni dello "stato dell'arte" percepita.

Le norme e gli altri documenti vengono redatti e sviluppati da **commissioni**, **sottocommissioni e gruppi di lavoro** definiti, per semplicità: **organi tecnici** - alla cui attività partecipano tutte le parti interessate assicurando, in tal modo, il necessario carattere di condivisione dell'iter normativo.

UNI: Commissione Agroalimentare (CA-003)

Campo di attività

Metodi di analisi chimica, microbiologica e sensoriale, campionamento dei prodotti agro-alimentari – Norme di prodotto– Norme di buona fabbricazione e di processo su filiere di prodotti agro-alimentari – Requisiti di imballaggi e materiali di imballaggio per alimenti – Requisiti di sicurezza e di igiene delle macchine per la lavorazione degli alimenti

Struttura della CA

Sotto-Commissioni SC

- **Latte e derivati (09)**
- Carni fresche e conserve di carne
- Cereali e derivati
- Condizionamento alimentare
- Macchine ed impianti per l'industria alimentare e la ristorazione collettiva
- Utensili a contatto con gli alimenti
- Ortofrutticoli freschi
- Ristorazione fuori casa

Gruppi di lavoro GL

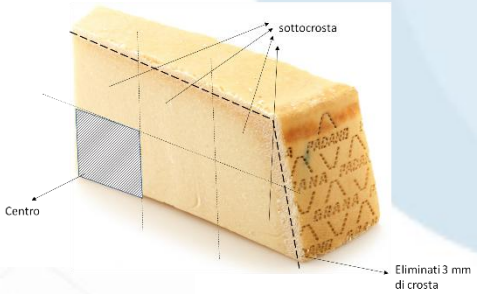
- Analisi chimica delle carni
- Riso
- Migrazioni specifiche da chiusure metalliche
- Qualità del PET
- Pappa reale
- Analisi microbiologica
- Analisi sensoriale
- Benessere animale
- Prodotti della pesca
- Prodotti non OGM
- Sistemi di gestione per la sicurezza alimentare
- Apparecchi per il trattamento dell'acqua non collegati alla rete idrica
- Oli, grassi animali e vegetali e loro sottoprodotti, semi e frutti oleaginosi

8

UNI/CT 003/SC 09: Latte e derivati

Obiettivi principali

Sviluppo – verifica - approvazione – recepimento di metodi di analisi chimica, microbiologica, campionamento, norme di prodotto



I membri della SC

Associazioni di categoria
Consorzi
Industria
Università
Enti di ricerca pubblici
Enti di ricerca privati
Enti Sanitari di Diritto Pubblico

10

Sviluppo di una norma

Dal mondo della produzione, del commercio e del consumo e anche dagli organismi di controllo nasce l'esigenza di un riferimento ufficiale che offra agli operatori una regolamentazione tecnica certa e condivisa

Il processo normativo

Proposta: approvazione CT

Messa allo studio

Inchiesta preliminare

Stesura del documento

Le procedure sono rigidamente codificate con regole interne ai sistemi di normazione. Lo stato dell'arte sulla materia viene presentato secondo una nuova prospettiva di sintesi e attraverso testi, formule, prospetti e figure.

Approvazione della SC

Approvazione della CT

Inchiesta pubblica finale

Pubblicazione

UNI/CT 003/SC 09: Latte e derivati

L'attività svolta dalla SC (1995---- Sviluppo di norme di prodotto

UNI 10537:1995 **Formaggio Mozzarella Tradizionale**. Definizione, composizione, caratteristiche e confezionamento

Il contenuto è stato utilizzato per la richiesta di attestazione di specificità che ha condotto alla concessione della definizione della Mozzarella Tradizionale come STG (Regolamento (CE) N. 2527/98 della Commissione).

Una Specialità Tradizionale Garantita (STG) è un'attestazione comunitaria che ha lo scopo di valorizzare dei prodotti agro-alimentari le cui peculiarità non dipendono dall'origine geografica, ma da una composizione tradizionale del prodotto, da una ricetta tipica o da un metodo di produzione tradizionale.

UNI/CT 003/SC 09: Latte e derivati

Formaggio Mozzarella in liquido di governo - Definizione, composizione, caratteristiche UNI 10979:2013

Formaggio Mozzarella a Bassa Umidità - Definizione, composizione, caratteristiche UNI 10848:2013

Formaggio Crescenza o Stracchino - Definizione, composizione, caratteristiche UNI 10535:2013

Formaggio Mascarpone - Definizione, composizione, caratteristiche UNI 10710:2013

Ricotta fresca - Definizione, composizione caratteristiche UNI 10978:2013

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UNI/CT 003/SC 09: Latte e derivati

Yogurt con aggiunta di altri ingredienti alimentari - Definizione, composizione e caratteristiche
UNI 10358:2016

Latte fermentato e latte fermentato con aggiunta di altri ingredienti alimentari - Definizione, composizione e caratteristiche
UNI 11633:2016

UNI/CT 003/SC 09: Latte e derivati

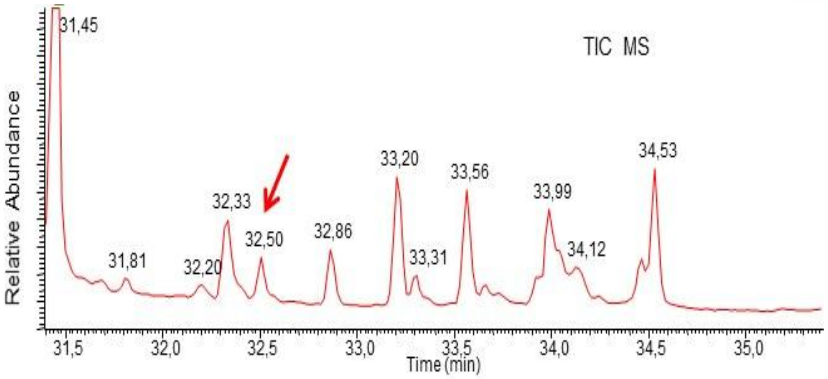
Metodi di analisi

Formaggi. Determinazione dell' attività fosfatasica. UNI 10437 :1996

Latte e polvere di latte, latticello e latticello in polvere; siero di latte e siero di latte in polvere, yogurt. Determinazione dell attività fosfatasica. UNI 10536:1995

Determinazione della massa sgocciolata della mozzarella in liquido di governo
UNI/TS 11587:2015

Determinazione di acidi grassi ciclopropanici nel formaggio - Metodo gascromatografico con rivelatore a spettrometria di massa (GC-MS)
UNI 11650:2016



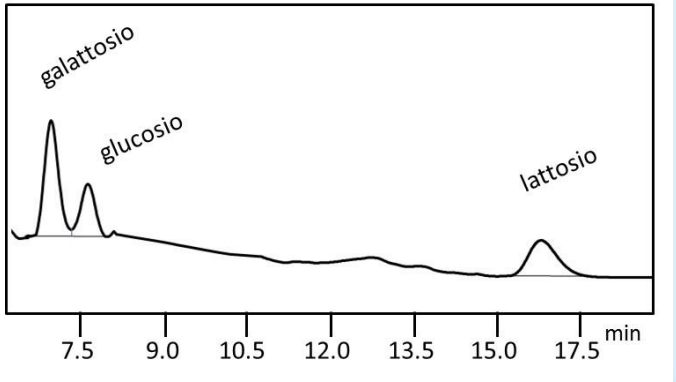
UNI/CT 003/SC 09: Latte e derivati

Norme allo studio

UNI1602160 Metodo per l'analisi del contenuto in lattosio, glucosio e galattosio di formaggi a pasta dura e lunga maturazione

Inchiesta preliminare: parere positivo

Preparazione del documento



Nuova proposta : Analisi di rapporti tra isotopi stabili di H, C, N e S in formaggi a pasta dura.

Sottoposta al parere della CT

16

Verifica /Approvazione/Recepimento

Nel 1991 fu siglato fra ISO e CEN un accordo (Vienna Agreement) con lo scopo di sottoporre al processo normativo europeo ed internazionale, in modo parallelo, argomenti di interesse comune, per evitare la duplicazione dei lavori, eliminare divergenze e facilitare la cooperazione nella stesura delle norme.

L'UNI, nel suo ruolo istituzionale, ha il duplice compito di emanare norme e prescrizioni tecniche, con periodica revisione ogni 5 anni, e di rappresentare l'Italia nelle attività di normazione a livello mondiale (ISO) ed europeo (CEN) **UNI: P Member**

Le CT UNI hanno anche il compito di seguire i corrispondenti lavori in sede CEN e ISO, definire la posizione italiana da far valere sui tavoli della normazione sovranazionale e di proporre le candidature per le rappresentanze nazionali nominate dall'UNI in seno agli organi tecnici CEN e ISO. Inoltre spetta alle commissioni tecniche predisporre le risposte alle inchieste sui progetti in corso di elaborazione sia livello europeo che mondiale.

ISO/TC 34/SC 5
Milk and milk products

ISO/TC 34/SC 9
Microbiology

CEN/TC 302 Milk and milk products - Methods of sampling and analysis

CEN/TC 275 Food analysis - Horizontal methods

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Esempio di revisione di una norma UNI in relazione al recepimento di norme a livello internazionale

UNI 10356:1993 Yogurt. Conta dei microrganismi caratteristici. Tecnica per il conteggio delle colonie a 37 °C. **Ritirata con sostituzione** con UNI ISO 7889 :2015 **che costituisce l'adozione nazionale in lingua inglese della norma internazionale** ISO 7889 :2003 Yogurt -- Enumeration of characteristic microorganisms -- Colony-count technique at 37°C

18

Attività di revisione di norme internazionali

Riferimento: ISO 1736:2008 (Ed 4, vers 2)

Comitato:	UNI/CT 003/SC 09	**Tipo:**	NPOS(A) (Voto automatico di posizione nazionale)
Stadio:	Aperto		
Data di apertura:	2017-01-20	**Data di chiusura:**	2017-05-22
Aperto il:	2017-01-20 00:04		

Titolo: Dried milk and dried milk products -- Determination of fat content -- Gravimetric method (Reference method)

Scadenza Segreteria: Si

Informazioni sull'origine della votazione

Riferimento:	ISO 1736:2008 (Ed 4, vers 2)	**Tipo:**	ISO/SR (Systematic review)
Comitato:	ISO/TC 34/SC 5		
Data di apertura:	2017-01-15	**Data di chiusura:**	2017-06-05

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Approvazione dello sviluppo di nuove norme internazionali (NWIP) con eventuale nomina di esperti

Reference number: ISO/NP 22579
ISO/TC 34/SC 5
N 1142

Infant formula and adult nutritionals -- Determination of fructans -- High performance anion exchange chromatographic with pulsed amperometric detection (HPAEC-PAD) after enzymatic treatment.

20

Per maggiori informazioni:

www.uni.com

www.iso.org

www.cen.eu

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THE GLOBAL STANDARD
FOR LIVESTOCK DATA

Network. Guidelines. Certification.

ICAR 2017

ICAR organisation and services offered to dairy laboratories

25-3-2017 Martin Burke, CE ICAR, www.icar.org

Contents;

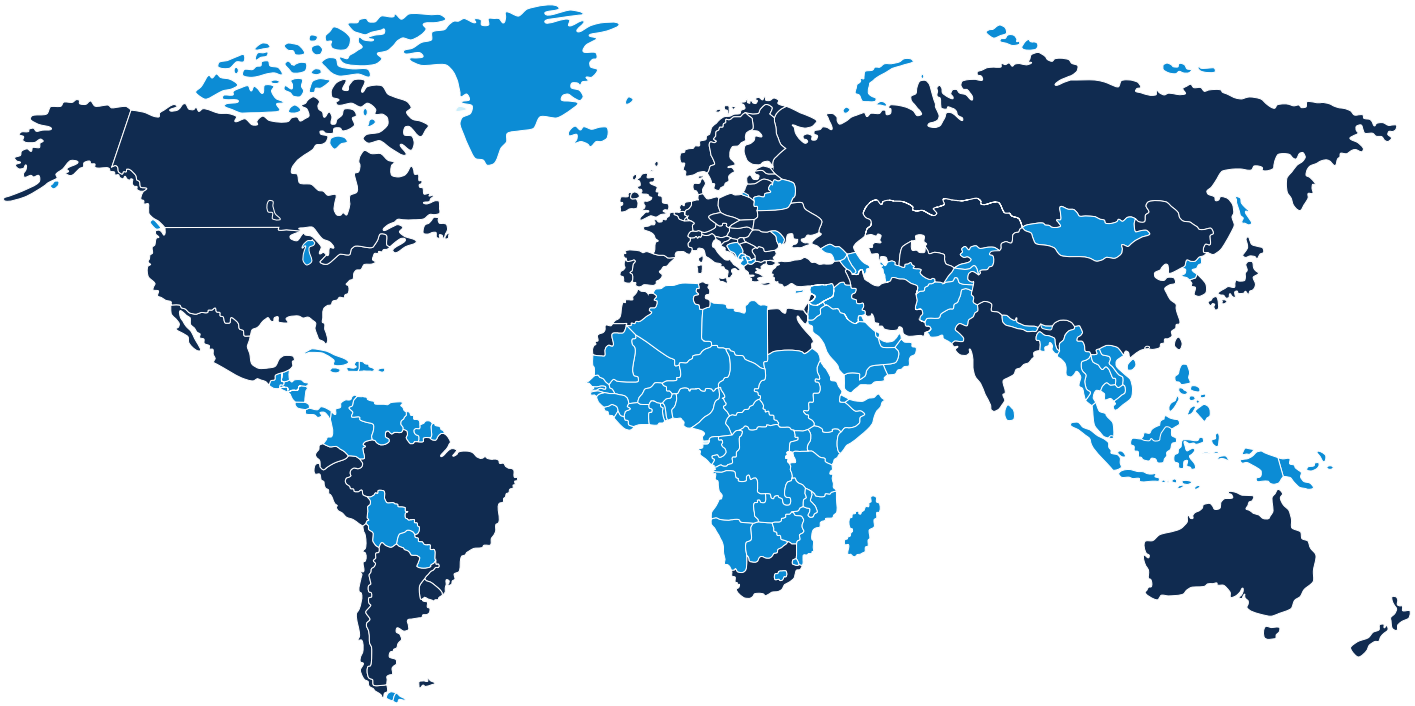
- **ICAR Facts**
- **ICAR Structure & Group activity**
- **ICAR Services inc. to Dairy Laboratories**

ICAR fact sheet;

- ICAR: The International Committee for Animal Recording
- International Non-Governmental Organization (INGO)
- Formed on March 9th, 1951, in Rome
- ICAR is composed of 117 Members from 59 countries;
  87 Full Members, 30 Associate Members.

ICAR's members

ICAR has 117 members (87 Full members + 30 Associate members) in 59 countries



Countries (in dark blue) with at least one organisation as ICAR Member

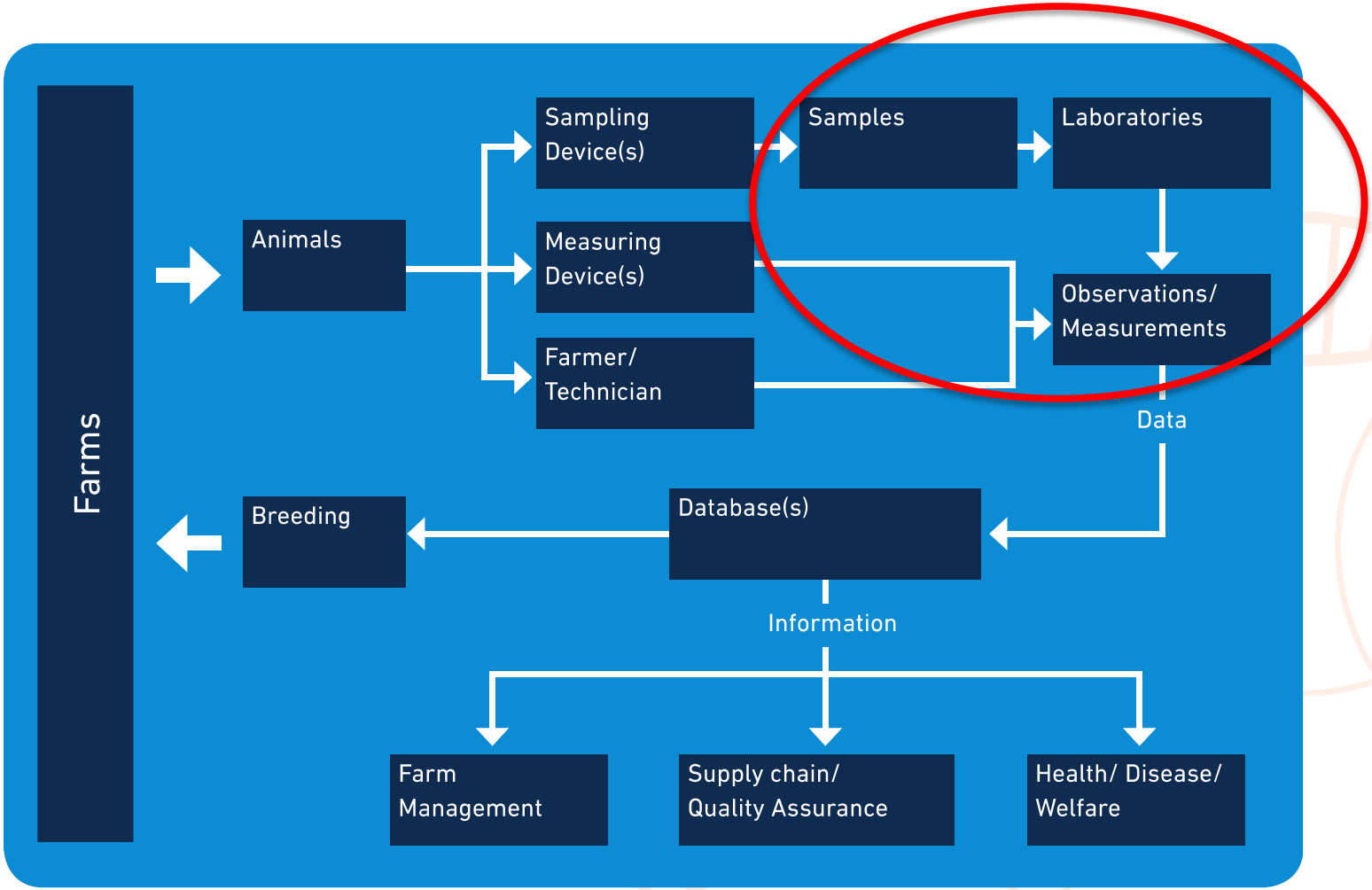
ICAR Mission Statement

Mission of ICAR is to be the leading global provider of Guidelines, Standards and Certification for animal identification, animal recording and animal evaluation.

ICAR wants to improve the profitability, and sustainability of farm animal production by:

- Establishing and maintaining guidelines and standards for best practice in all aspects of animal identification and recording.
- Certifying equipment, and processes used in animal identification, recording and genetic evaluations.
- Stimulating and leading: continuous improvement, innovation, research, knowledge development, and knowledge exchange.

Where ICAR operates



Content

- ICAR Facts
- Structure & Group activity
- ICAR Milk Analysis Services
- ICAR 2016 and beyond

ICAR Stucture

- **ICAR is "The" international reference guideline for animal identification, recording systems, analysis (Data & Lab) and genetic evaluation.**

- **The ICAR activities are managed by ;**
  - **4 Permanent Sub-Committees (SCs)**
  - **12 Working Groups (WGs) plus 3 Task Forces and various Expert Advisory Groups which support the SCs & WGs**

ICAR Current Technical Organisation

Animal identification Devices SC

Recording & Sampling Devices SC

Milk Analysis SC

Interbull SC

4 Permanent Sub-Committees

Animal Data Exchange

Artificial Insemination Technologies

DNA WG

'Feed & Gas'

Interbeef

Breed Assns

Dairy Cattle Milk Recording

12 Working Groups

Global Reach

Sheep, Goat & Small Camelids

Conformation Recording

Animal Care *

Functional Traits

Administrative bodies

ICAR & S-ICAR Board

General Assembly

3 Task Forces

* Animal Care under IDF's SCAHW

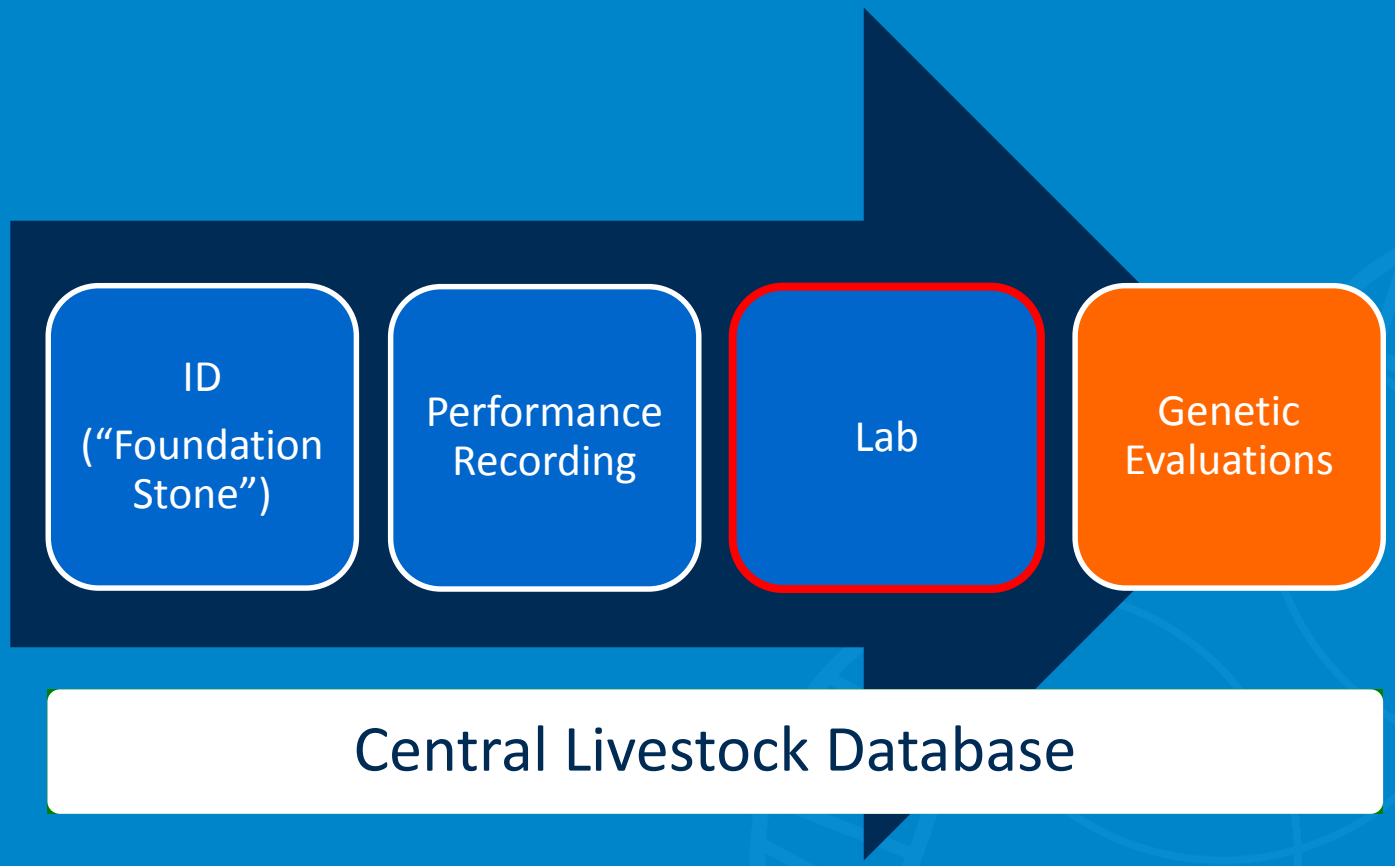
ICAR Guidelines and Standards

- Results of the work of the ICAR Sub-Committees and Working Groups are the “ICAR RECORDING GUIDELINES”
- The Guidelines is a “living being” of amendments/updates, according to new technologies, tools and developments
- Every year new text of RG is proposed to GA for approval

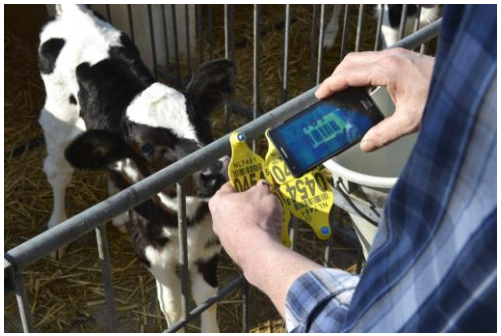
Content

- ICAR Facts
- Structure & Group activity
- ICAR Services inc. Milk Analysis Services
- ICAR 2016 and beyond

ICAR's 4 Permanent Building Blocks

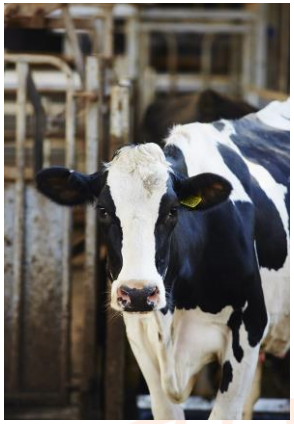


ICAR's (Independent) Services;



- **Identification Tag Test and Certification**
  - ICAR and ISO have together developed test procedures, protocols and guidelines through which compliance of RFID systems with the ISO standards can be verified.
  - Since 2007, ICAR is the Registration Authority for ISO in respect to ID devices conforming to ISO Standards 11784 / 11785.
  - Working with our Industry stakeholders ICAR has in 2016 introduced a QA system for ID, namely; Certification, 5Yr Retest, DCN, Field Validation Services.

ICAR's (Independent) Services ;



- **Recording Device Test and Certification**
  - Evaluates, tests and certifies milk recording and other animal recording/sampling devices in the market for compliance with stipulations of the latest ICAR Recording Guidelines. (Section 11)
  - In 2016 ICAR convened a Task Force to review Sensors in Recording. The goal of this ICAR Sensor Task Force is to provide guidelines/methodology to help classify and qualify Sensors and Sensor data.

ICAR's (Independent Services) ;

- **International Genetic Evaluations**
  - The **INTERBULL Sub Committee** is responsible for coordinating the research and development of methods for international evaluation of the genetic merit of dairy cattle on behalf of ICAR members.
  - Likewise, the **INTERBEEF Working Group** is responsible for international genetic evaluation of beef cattle.
  - This international evaluation work is done by the **Interbull Test Centre** at our strategic partner, the Department of Animal Breeding & Genetics in the **University of Uppsala in Sweden (SLU)**.

ICAR's (Independent) Services ;

- **DNA Laboratory Accreditation**
  - Provides Accreditation for laboratories who analyse biomaterial to produce DNA Genotypes (DNA Data). For this accreditation, applicants (so called wet labs) have to provide a valid ISAG membership number. ICAR maintains a list of accredited laboratories on its website.
- **DNA Interpretation Centre Accreditation**
  - ICAR has developed a new Accreditation for DNA Data Interpretation Centres who take the DNA Data from the 'wet labs' above and interpret the data for the purposes of Animal Identification, Parentage Verification and Parentage Discovery. (so called dry labs).

ICAR's (Independent) Services;

- **Milk Analysis Proficiency Testing (PT)**
  - Provides an international Inter-laboratory Proficiency Test programme for member laboratories. The participation in ICAR's twice yearly PT Test complies with analytical quality assurance requirements in ISO 17043.
  - The ICAR PT parameters considered are: fat, protein, urea, somatic cell, lactose, Beta-Hydroxybutyric (BHB), PCR and Pregnancy Associated Glycoproteins (PAG).

ICAR SC MILK ANALYSIS – GOALS

To promote and to maintain in ICAR dairy laboratories the highest possible standard of accuracy and precision to build confidence in the comparability of measurements

- ICAR **Proficiency Testing** scheme for milk analyses
- ICAR **Milk Analyser Equipment Certification**

Why an ICAR Proficiency Test (PT)?

- To create a professional collaboration with ICAR PT participants
- To calculate the precision among the ICAR laboratories for reference and routine methods
- To evaluate if the ICAR PT precision is fit for ICAR purposes and if comparable with the precision specified in the ISO standard

Why an ICAR Proficiency Test (PT)?

- To highlight the laboratories that participate in the ICAR PT as part of their overall ICAR Certificate of Quality
- To provide an ICAR PT as per ISO 17043
- To provide feedback to Labs on their individual performance over time

To connect the ICAR milk reference laboratories in a GLOBAL connection providing an international anchorage

Participating countries (blue) in the ICAR PT (2016-17)

45 Participants – 34 Countries- 5 Continents

ICAR has members in 59 countries

Milk Analysers Certification

ICAR Protocol for evaluation of Milk Analysers

=

ISO 8106-3 IDF 128-3

Protocol for the evaluation and validation of alternative quantitative methods of milk analyses

Newly Launched March 2017 !

International ICAR Milk Analysers Certification - needs coordination !

ICAR's Values 2017 & Beyond;

Summary of Benefits – 7 Reasons to work with ICAR

1. An open platform for best practices and shared development
2. A shared system for the benefit of all in quality livestock production
3. Helping to keep up with speed of innovation
4. Certification Services to validate quality and to stimulate open markets
5. A neutral body for open international markets and a level playing field
6. Working for equal opportunities for all, also in emerging markets
7. A roadmap to professional breeding programs

THE GLOBAL STANDARD
FOR LIVESTOCK DATA

Network. Guidelines. Certification.

Thank you !

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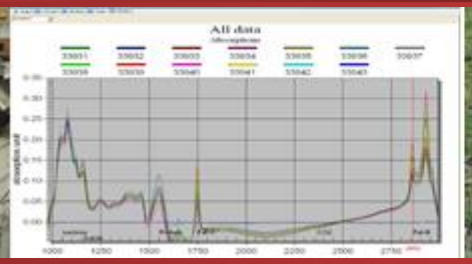
www.icar.org





Ketosis detection in Dairy Herds (DHIA) testing

A new global metabolic infrared spectral approach

Pierre Broutin,
EU Managing Director/Senior Scientist

AEOS Conference, Rome - March 23 , 2017

Why testing for ketosis?

In high producing dairy cows during early lactation, a negative energy balance (NEB) can be induced by an imbalance between energy intake and increasing demand for milk production leading to:

- Fat mobilization from adipose tissue
- Production of ketone bodies (acetone, β-hydroxybutyrate(BHB)…).
- Sub-clinical(SCK) or clinical ketosis (CK)

Ketosis metabolic disorder has a high prevalence (12-43%), is difficult to detect (1/5), and can lead to major negative impacts on dairy farms profitability and animal welfare:

Why testing for ketosis?

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- Fat mobilization from adipose tissue
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- Sub-clinical(SCK) or clinical ketosis (CK)

Ketosis metabolic disorder has a high prevalence (12-43%), is difficult to detect(1/5), and can lead to major negative impacts on dairy farms profitability and animal welfare:

- Decrease in milk production (-300 to 450 kg/lactation) (Duffield,2000)
- Substantial modification of milk composition (fat↑, protein↓, fatty acids profile…)
- Impaired reproduction with conception rate at AI1 down -3 to 35% (Fourichon et al,2000)
- Increased risk for other metabolic disorder (clinical ketosis, displaced abomasum, metritis…)
- Increased severity and duration of mastitis cases with depletion of the immune system
- Indirectly increases culling rate

Cost per case 250-600 EUR depending on conditions

How to diagnose Subclinical Ketosis (SCK)?
2 types of ketosis and associated biomarkers:

2 types of ketosis with associated biomarkers:			
Ketosis type	biomarker	Concentration range	Status
Hypoglycemic	high [BHB] in blood*	Blood BHB > 1,2 mmol/l	SCK
Hyperglycemic	high [NEFA] in blood**	< 0,4 mmol/l	physiological
		0,4-0,6 mmol/l	mild mobilization
		> 0,6 mmol/l	severe fat mobilization

But direct Blood BHB (Gold Standard) & NEFA determinations are invasive and not practical for routine DHIA testing

** BLOOD BHB = GOLD STANDARD*
*** NEFA: Non Esterified Fatty Acids*

Are Ketosis biomarkers detectable in milk by infrared?

- **Milk Acetone:** very volatile and low concentration in milk
  typically < IR detection limit
- **Milk BHB:** more stable than acetone but levels also very low
  typically < IR detection limit (DL)

Milk BHB (0.10 – 0,60 mmol/L) = (1,04–6,24 mg/dl!!) << urea (10-100 mg/dl)

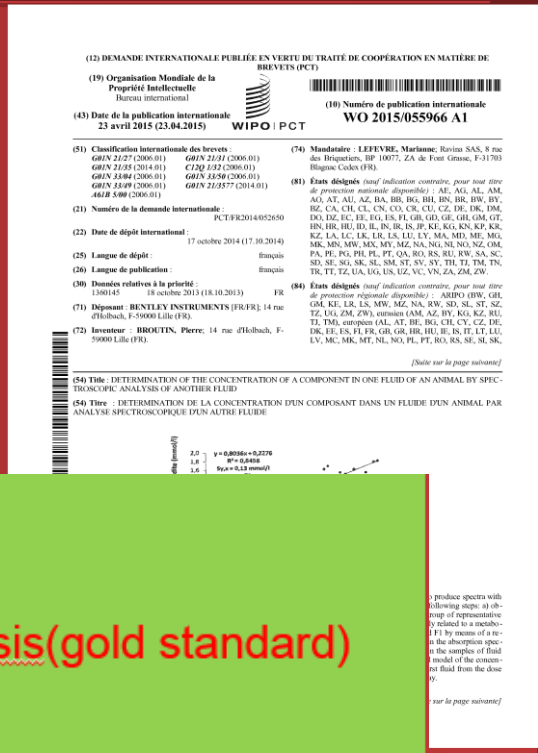
- **Milk BHB** content decreases also rapidly if milk not stored at 4°C right after milking
- Correlation (r) between milk and blood BHB very variable (0,00-0,87) (*Enjalbert et al. 2001)*

Cc: *Direct Milk* Acetone & BHB determination by IR presents some major drawbacks because of their volatility, very low concentration levels (below DL), and very variable correlation with Blood BHB (Gold Standard)

A new global metabolic infrared spectral approach for Blood BHB prediction and SKC detection (patented)

1 – Correlation between ketosis metabolic disorder and overall milk composition & spectra?

2 - Can the metabolic disorder be modeled (PLS) to predict Blood BHB from the Milk Spectra?



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(81) États désignés *(sauf indication contraire, pour tout titre de protection nationale disponible)* : AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, *ZM, ZW*.

(84) États désignés *(sauf indication contraire, pour tout titre de protection régionale disponible)* : ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, *ZM, ZW*), eurasien (AM, AZ, BY, KG, KZ, RU, TJ, TM), européen (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,

[Suite sur la page suivante]

(54) Title : DETERMINATION OF THE CONCENTRATION OF A COMPONENT IN ONE FLUID OF AN ANIMAL BY SPECTROSCOPIC ANALYSIS OF ANOTHER FLUID

(54) Titre : DETERMINATION DE LA CONCENTRATION D'UN COMPOSANT DANS UN FLUIDE D'UN ANIMAL PAR ANALYSE SPECTROSCOPIQUE D'UN AUTRE FLUIDE

Current: . → Ketosis

New:  ? → Blood BHB/Ketosis(gold standard)

Prediction of the Blood BHB from the milk spectra by modeling the milk composition overall variations induced directly or indirectly by the metabolic disorder under consideration

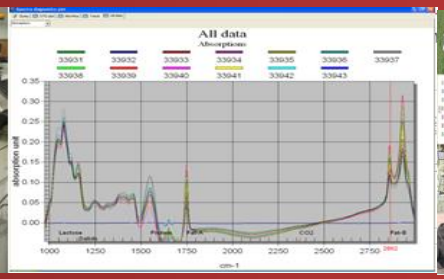
Blood BHB Determination by infrared spectroscopy for the monitoring of cows metabolic activity and SKC detection

Study Protocol:

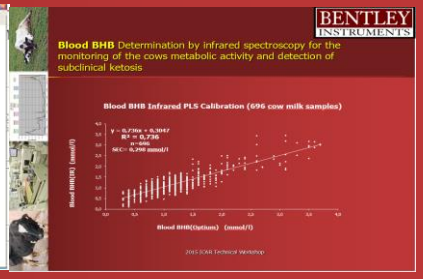
- 696 Holstein cows tested for blood BHB (Optium Xceed reader) over a 6 months period (DIM<100)
- Blood taken from the coccygeal vein (AM/PM)
- Samples cooled down immediately at 4°C after milking
- Milk samples tested on Bentley FTS within 12 hours to collect MIR spectra
- Development of a PLS model to predict Blood BHB based on Milk spectra

Optium Xceed reader

Bentley Ilas Combi 600



MIR spectra



Blood BHB PLS Calibration

BENTLEY INSTRUMENTS

Blood BHB Determination by infrared spectroscopy for the monitoring of cows metabolic activity and SKC detection

Samples preparation standardization

Study Protocol:

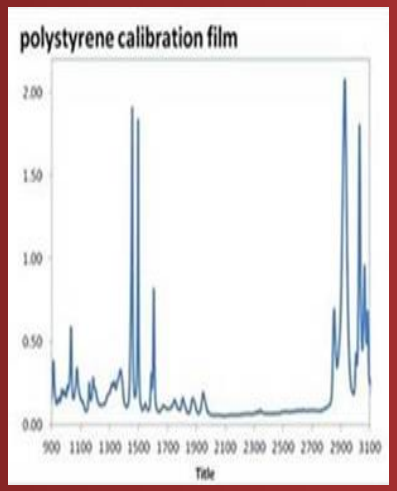
All samples preparation and operating conditions were standardized using the Bentley FTS ILAS 3000 robot
(samples identification, heating, shaking…)

Blood BHB Determination by infrared spectroscopy for the monitoring of cows metabolic activity and SKC detection

Spectra Standardization

Study Protocol:

All spectra X axis standardized with a polystyrene film (automatic)



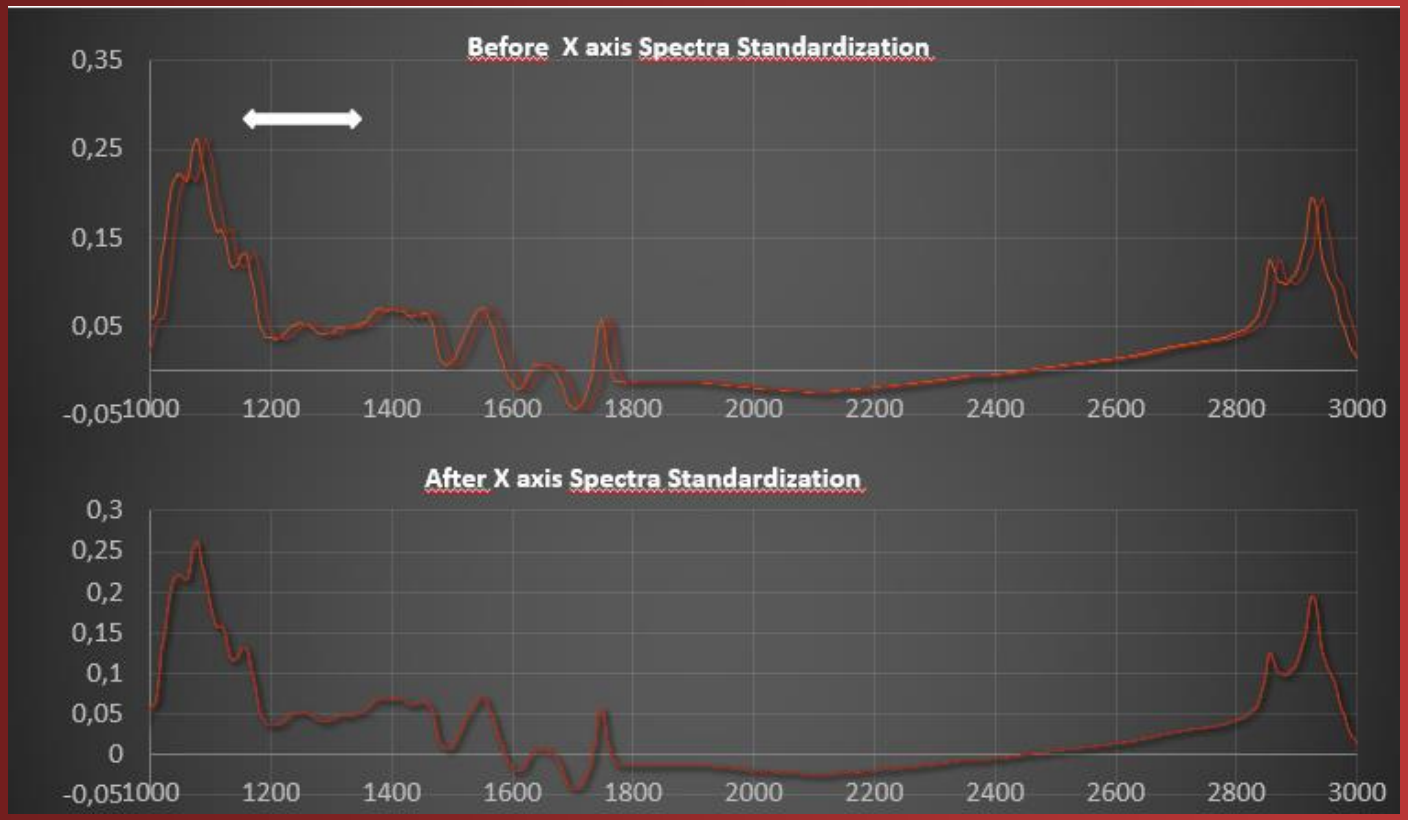
- **Example: Polystyrene Test**
- [4:30 PM Central Daylight Time] Polystyrene Test: STARTED
- Background Scan Completed
- Polystyrene Scan Completed
- **Peak 3082.22 @:3082.18 cm-1**
- **Peak 3060.14 @:3060.12 cm-1**
- **Peak 1601.38 @:1601.37 cm-1**
- **Peak 1583.04 @:1583.24 cm-1**
- **Peak 1028.42 @:1028.59 cm-1**
- [4:31 PM Central Daylight Time] Polystyrene Test: PASSED
-

(internationally recognized NIST standard)

Blood BHB Determination by infrared spectroscopy for the monitoring cows metabolic activity and SKC detection

Spectra Standardization

X axis spectra standardization with a polystyrene film

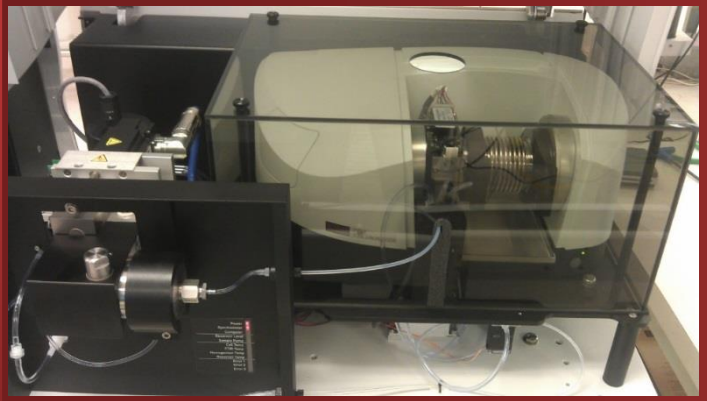


Blood BHB Determination by infrared spectroscopy for the monitoring of cows metabolic activity and SKC detection

Spectra Standardization

Study Protocol:

All spectra Y axis standardized with our patented process (no reagent)



$$A = \log_{10}\frac{I_o}{I} = \varepsilon\, l\, c$$

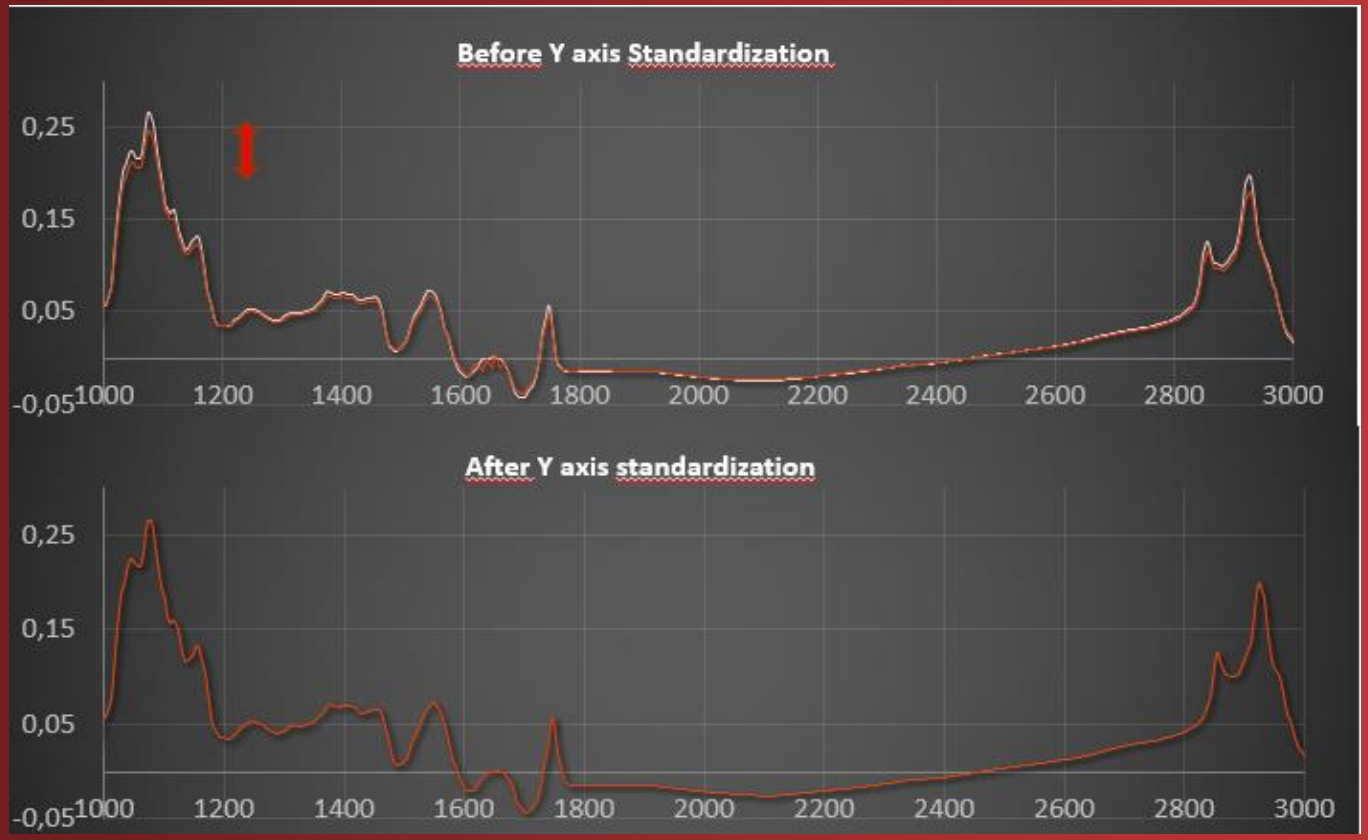
ε : Molar absorptivity
l : cell path length
c : concentration

The IR cell path length need to be verified regularly, frequency depending of the type of products analyzed, since it may change over time due gradual erosion of the cell internal surface (1% per month, up to 12% per year)

Blood BHB Determination by infrared spectroscopy for the monitoring cows metabolic activity and SKC detection

Spectra Standardization

Y axis spectra standardization (patented)



A new global metabolic infrared spectral approach for Blood BHB prediction and SKC detection (patented)

n=280 (individual cows)

Mean Blood BHB = 1,043 mmol/L = 10,41 mg/dl

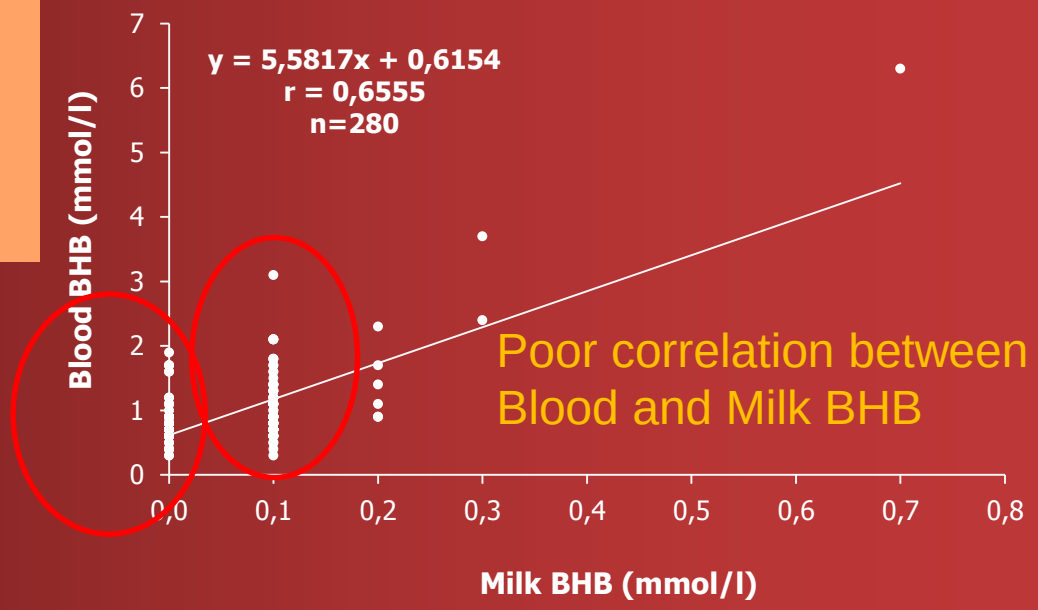
Mean Milk BHB = 0,058 mmol/l= 0,6 mg/dl < DL

Blood BHB > 13,6 x Milk BHB

r=0,6555 (but can vary from 0 to 0,87*)

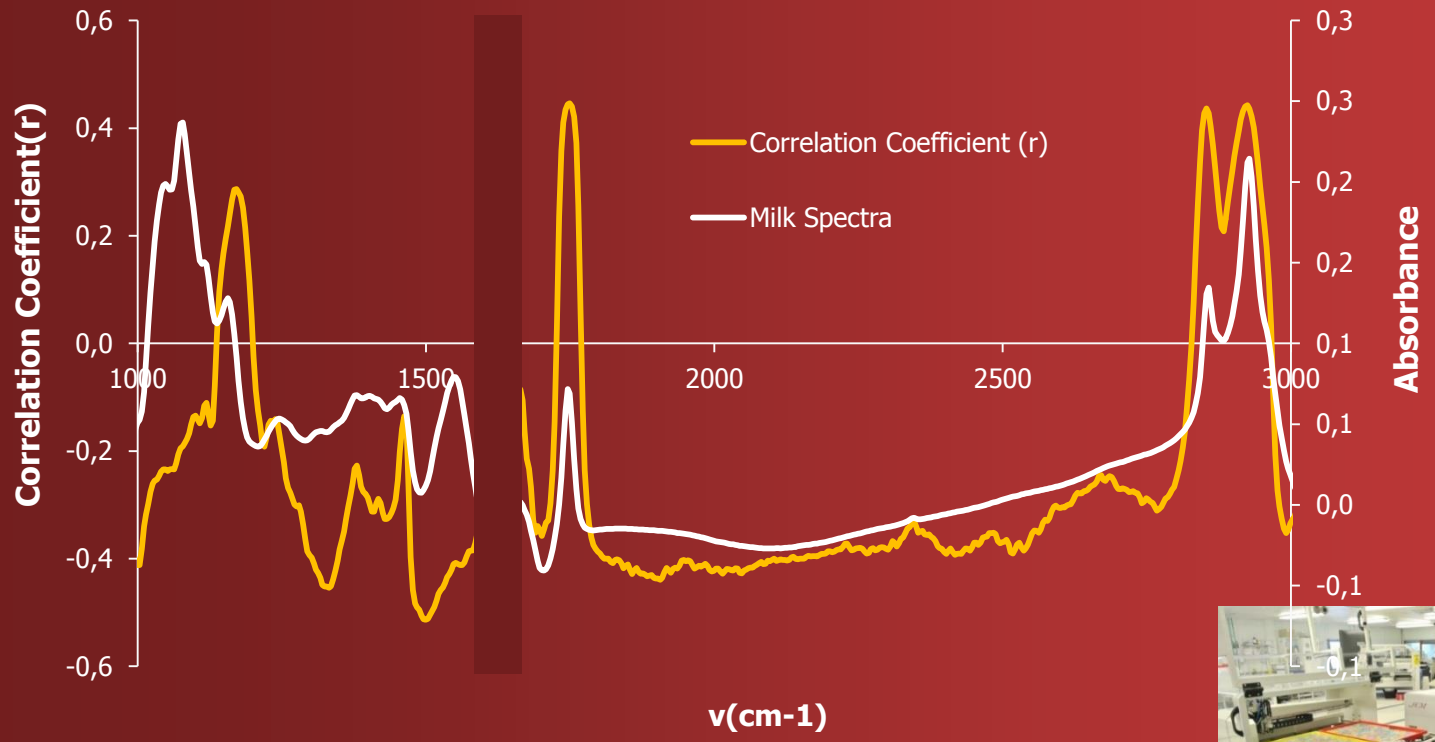
*Enjalbert et al. Journal Dairy Science, 2001 84:583-589

Blood BHB vs Milk BHB Concentration (Optium)



1- Correlation between SKC metabolic disorder and overall milk composition & spectra (696 cows)?

Correlation(r) between Blood BHB and Milk spectra



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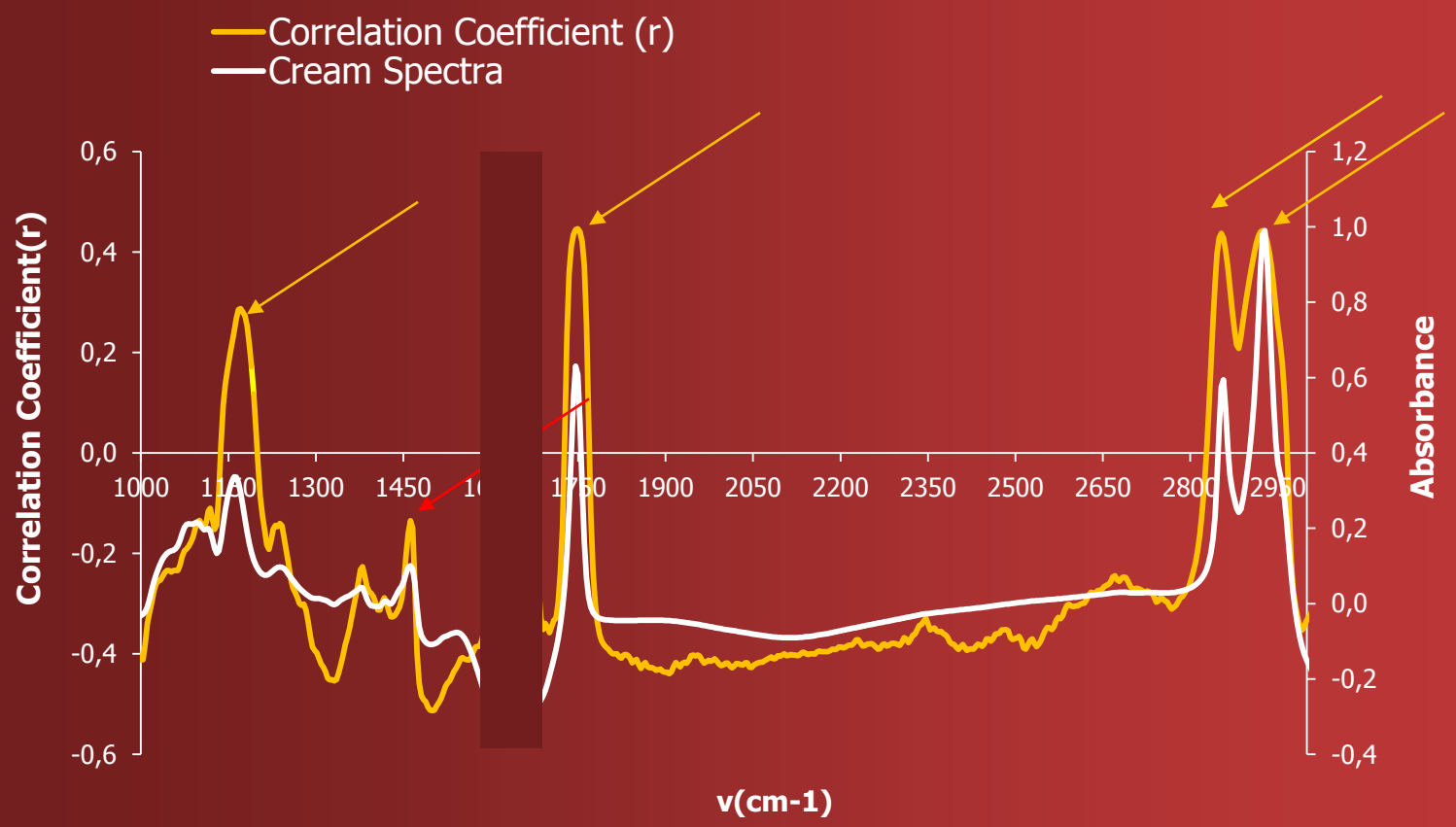
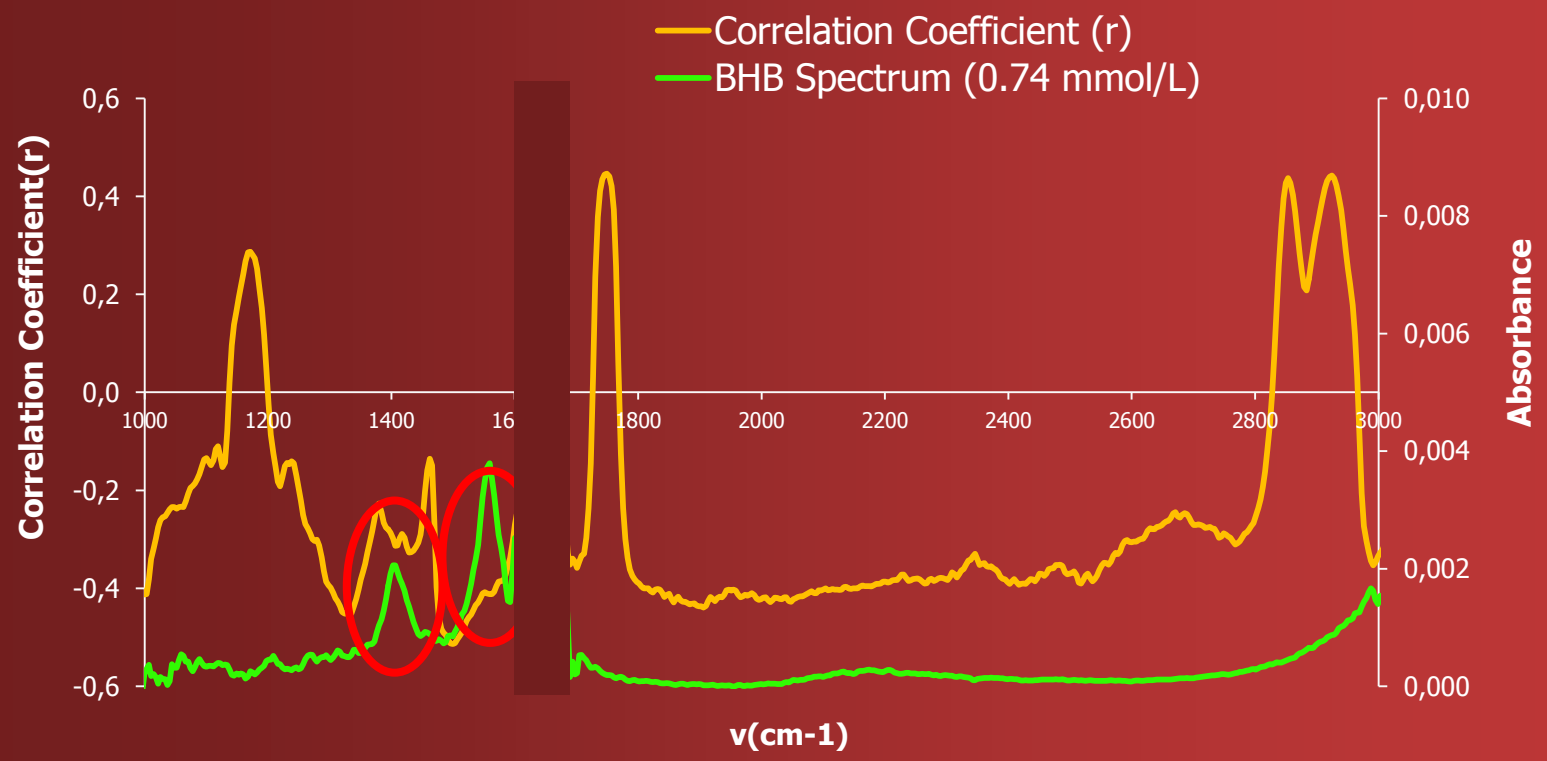


Cc: Blood BHB is mostly correlated with the milk Fatty Acids Profile (FAP)

1- Correlation between SKC metabolic disorder and overall milk composition & spectra (696 cows)?



Cc: Low correlation between Milk Spectra and Blood BHB where BHB molecule main absorption wavebands are located (1410; 1562 cm^{-1})

1- Correlation between SKC metabolic disorder and overall milk composition & spectra (696 cows)?

Components (X)	r/BBHB(Optium)	BBHB <1,2 (mmol/l)	BBHB >1,2* (mmol/l)	Wi	% Wi
Protein	-0,26	**32,58**	**31,56↓**	-1,02	-3,13%
Palmitic(C16:0)	-0,13	1,36	1,35=	-0,01	-0,81%
SCC	-0,12	165,00	114,00↓	-51,00	-30,91%
Saturated FA	-0,07	2,73	2,76	0,03	1,21%
Lactose	0,02	48,07	48,45↑	0,38	0,79%
Fat	0,15	**41,73**	**43,34↑**	1,61	3,86%
Poly Unsaturated FA	0,27	0,16	0,17	0,02	10,97%
Fat/Protein	0,39	1,279	1,379↑	0,100	7,82%
Unsaturated FA	0,47	1,20%	**1,35%↑**	0,15%	**12,50%↑**
Mono Unsaturated FA	0,48	1,08%	**1,20%↑**	0,12%	**11,11%↑**
Oleic (C18:1)%	0,52	0,84%	**0,96%↑**	0,13%	**15,21%↑**
Stearic (C18:0)%	0,57	0,36%	**0,41%↑**	0,06%	**16,01%↑**
Oleic/Protein	0,66	0,026	**0,031↑**	0,005	**19,23%↑**
Stearic/Protein	0,66	0,011	**0,013↑**	0,002	**18,18%↑**

More research under way: 416 fatty acids in bovine milk (Jensen, 2002)

1 – Correlation between SKC metabolic disorder and overall milk composition & spectra (696 cows)?

Components (X)	r/BBHB(Optium)	BBHB <1,2 (mmol/l)	BBHB >1,2* (mmol/l)	Wi	% Wi
Protein	-0,26	**32,58**	**31,56↓**	-1,02	-3,13%
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More research under way: 416 fatty acids in bovine milk (Jensen, 2002)

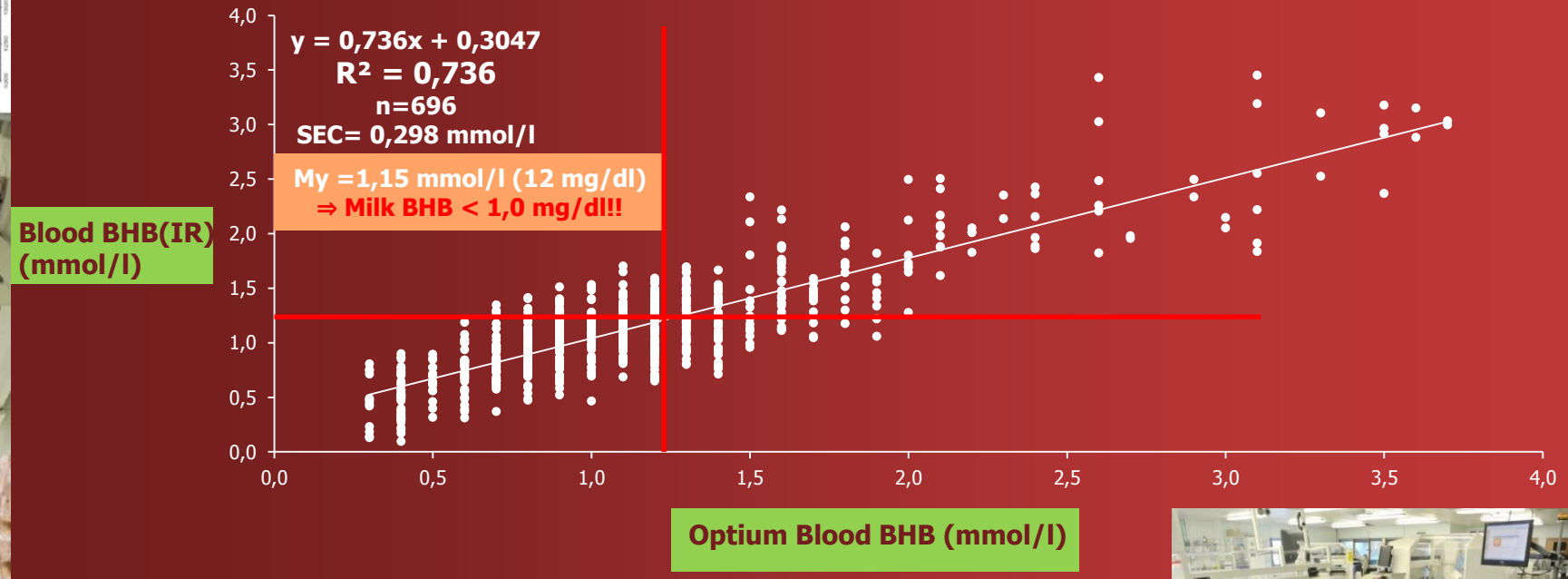
Bentley FTS Fatty Acids Calibrations

Typical results obtained on bulk cow milk with PLS Calibrations					
Components	**Measuring Range**	**Validation range**	**Repeatability (Sr)**	**Accuracy (Sy,x) (Bulk)**	**Carry-Over**
C:16:0 (Palmitic)	0,43-2,45%	0,78-1,51%	0.027%	**0.056%** (0,070-0,094)*	< 1.0%
C:18:0 (Stearic)	0,12-0,70%	0,24-0,47%	0.012%	**0.035%** (0,040-0,055)*	< 1.0%
C:18:1 (Oleic)	0,21-1,81%	0,34-1,81%	0.020%	**0,027%-0.050%**	< 1.0%
Saturated FA	0,96-4,50%	1,27-4,38%	0.025%	**0.045%** (0,037-0,055)*	< 1.0%
Unsaturated FA	0.41-2.17%	0,41-2,17%	0.024%	**0.049%**	< 1.0%
Mono Unsaturated FA	0,33-1,99%	0,37-1,96%	0.023%	**0.046%** (0,040-0,061)*	< 1.0%
Poly Unsaturated FA	0.03-0.24%	0,10-0,24%	0.006%	**0.020%** (0,010-0,020)*	< 1.0%

* Bulletin of International Dairy Federation 406/2006, p.25

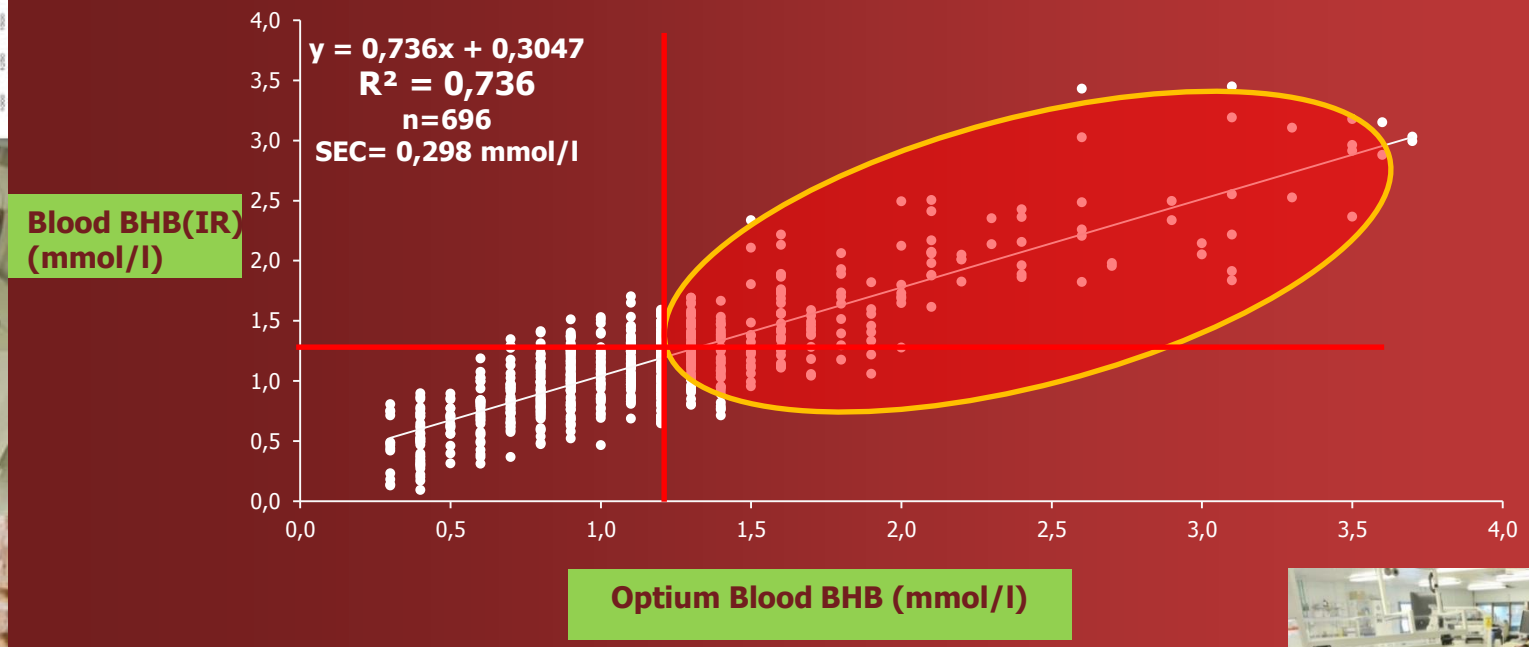
2 - Can the metabolic disorder be modeled (PLS) to predict Blood BHB indirectly (696 cows)?

Blood BHB Infrared PLS Calibration



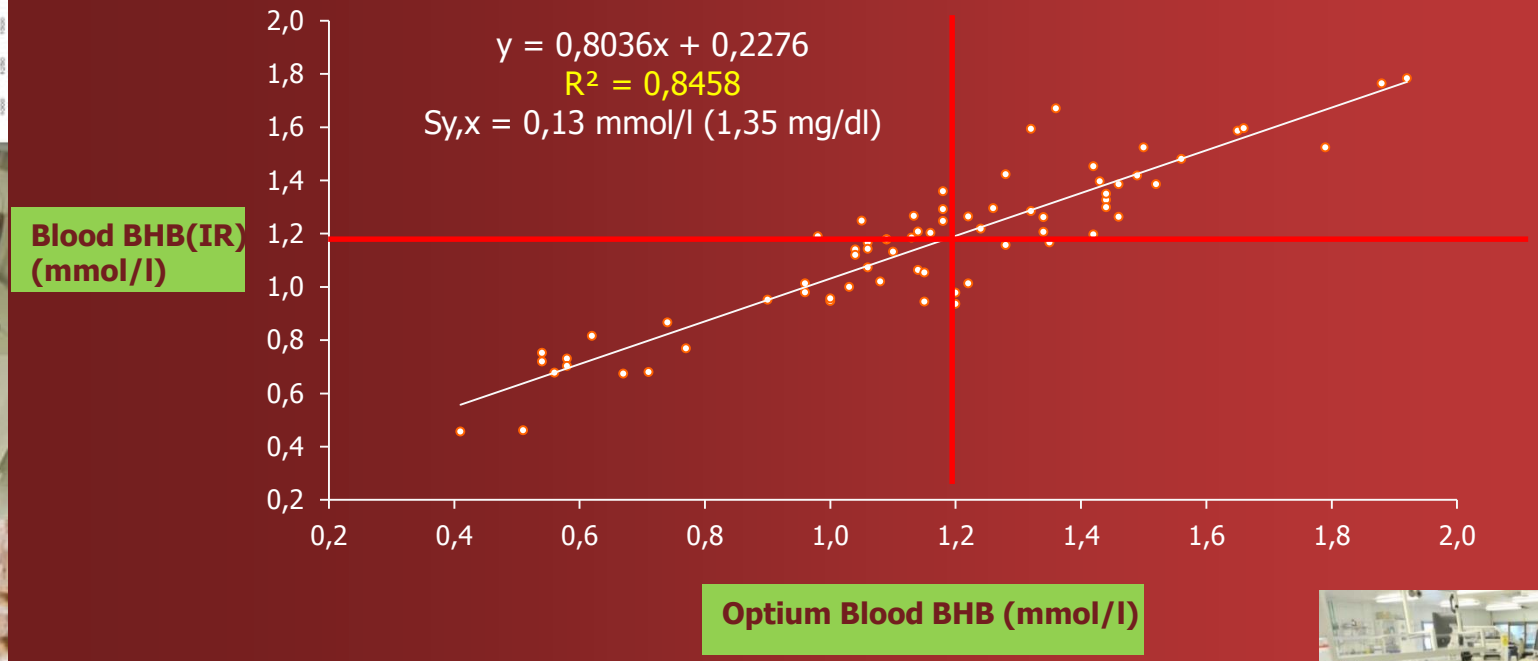
A new global metabolic infrared spectral approach
How to implement it?

Blood BHB Infrared PLS Calibration



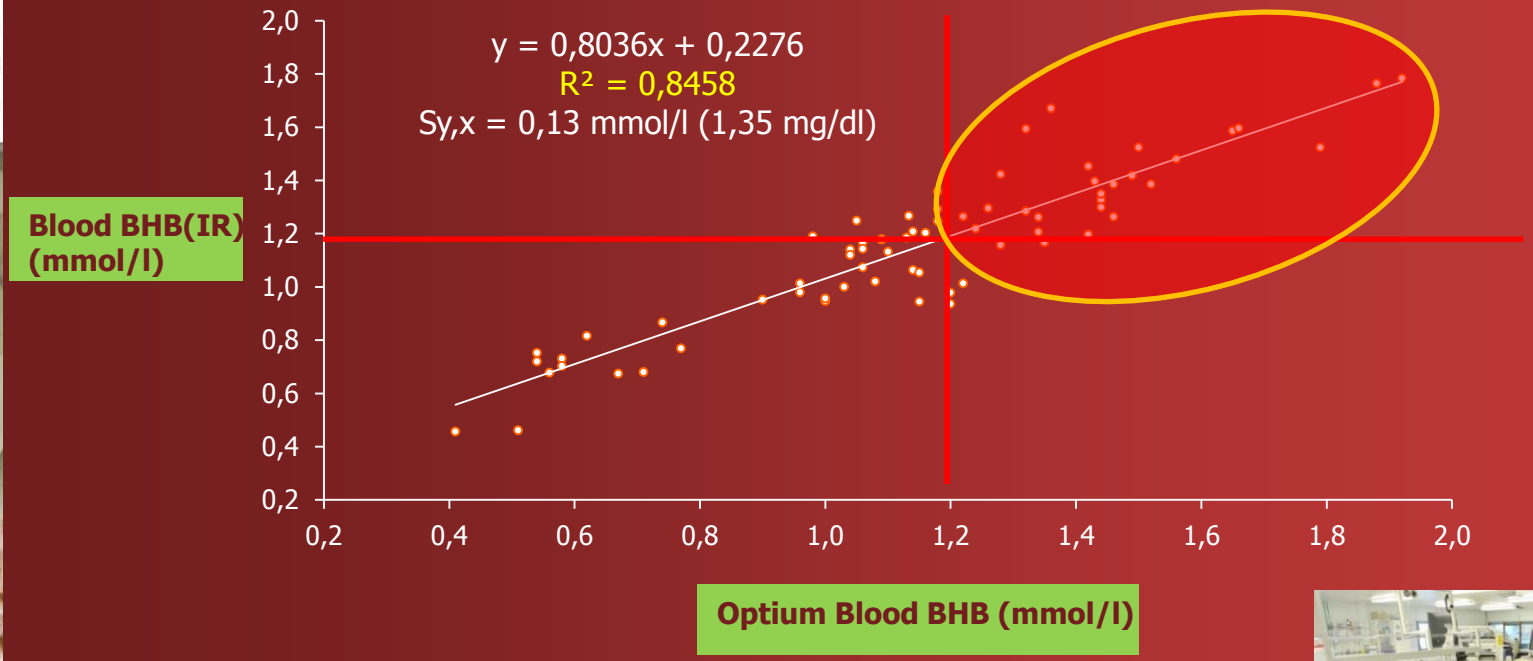
A new global metabolic infrared spectral approach
How to implement it (herd samples)?

Blood BHB Infrared PLS Calibration



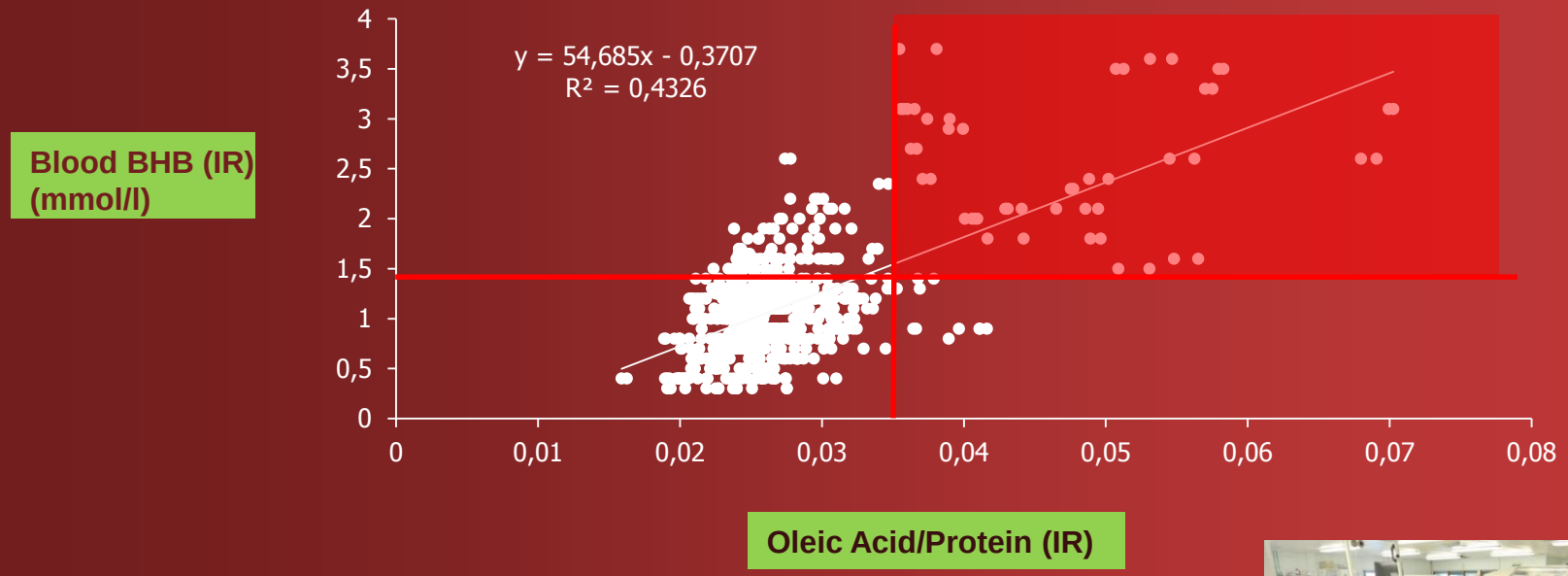
A new global metabolic infrared spectral approach
How to implement it (herd samples)?

Blood BHB Infrared PLS Calibration



How to improve still ketosis diagnostic? A multi-dimension approach

Blood BHB vs Oleic Acid/Protein Ratio on 696 individual cows



How to improve still ketosis diagnostic? A multi-dimension approach

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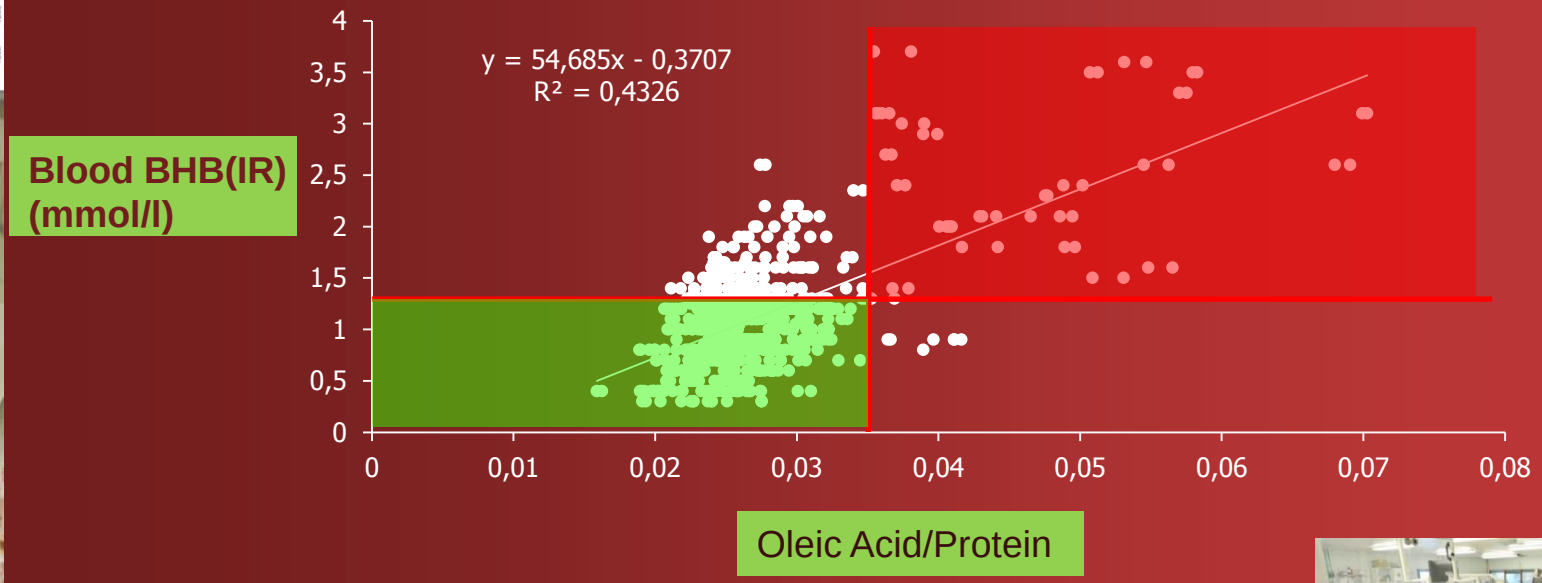
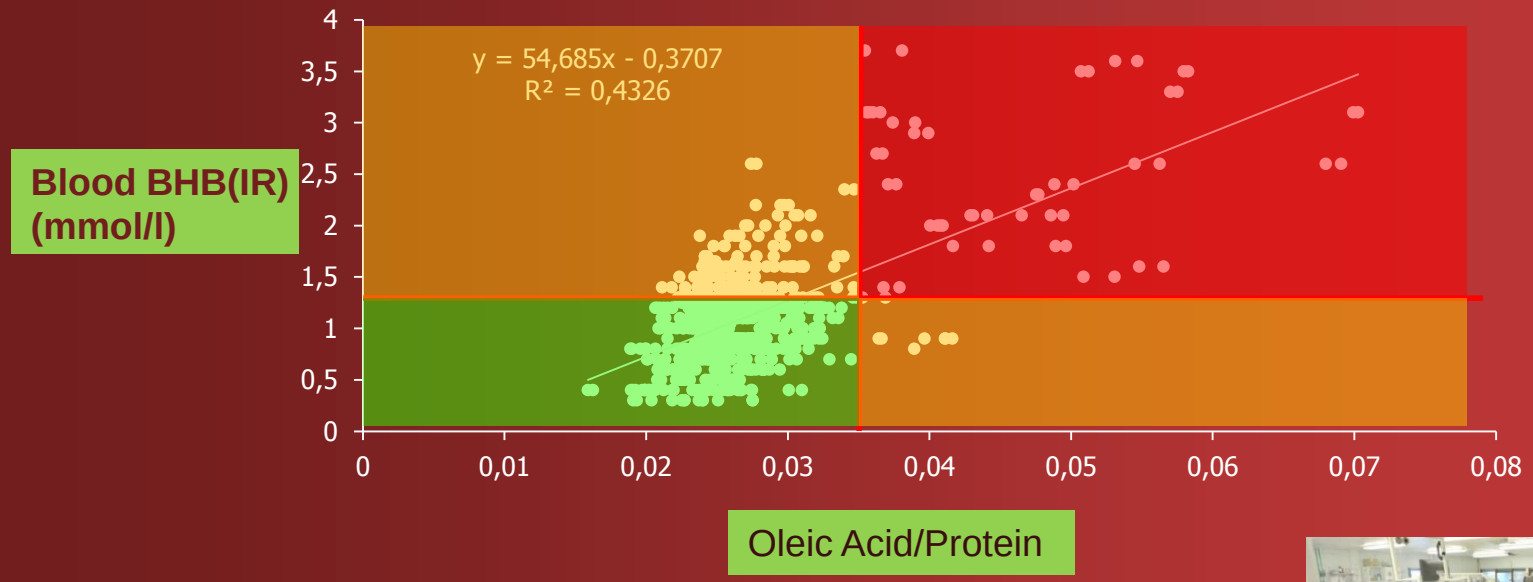
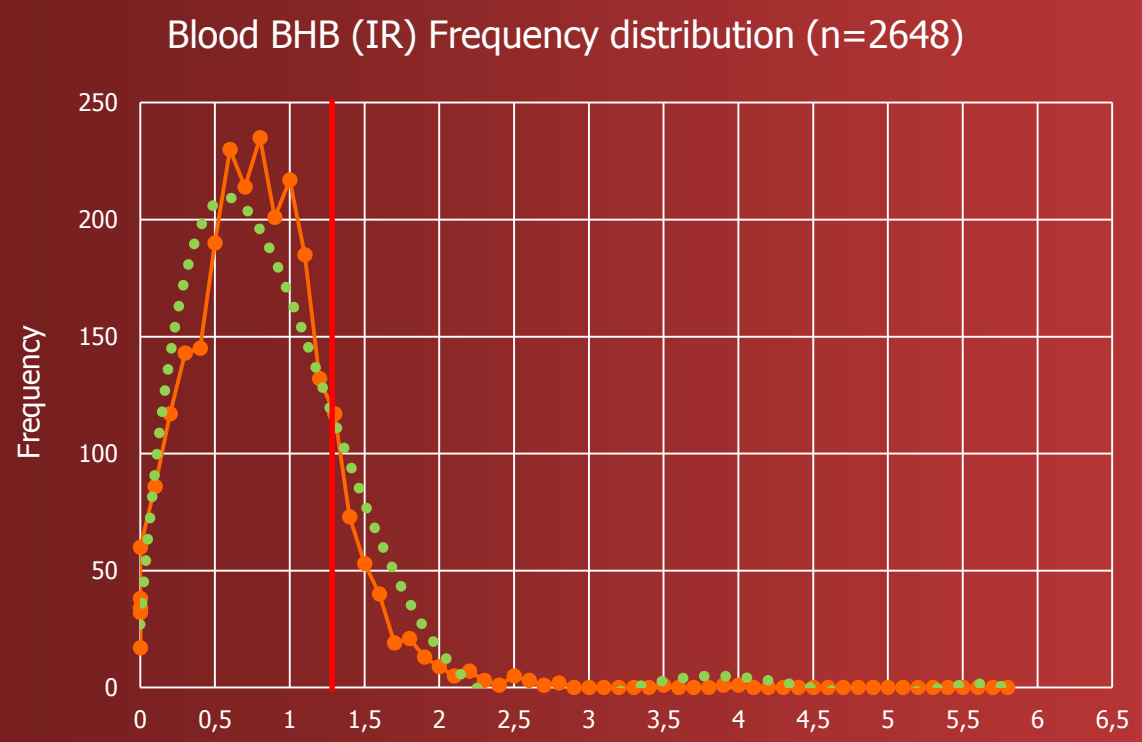


How to improve still the ketosis detection? A multi-dimension approach

Blood BHB vs Oleic Acid/Protein Ratio on 696 individual cows



Blood BHB Concentration distribution in DHIA samples



Bentley FTS Blood BHB (mmol/l)

Conclusions:

- The global metabolic spectral model is a very exhaustive and powerful approach to understand the relationship between a metabolic disorder and the milk spectra

- Blood BHB (IR) and Milk Fatty Acids Profile (and especially oleic acid) can successfully be used as ketosis biomarkers to improve SKC detection and to:
  - monitor individual cow Blood/FAP/Milk BHB variations over time
  - compare individual cows at herd level to develop a relative approach by setting a baseline (intra-herd) – **recommended approach**
  - to detect ketosis prevalence at herd level (inter-herds)

The Oxygen DHIA/FR laboratory has been using this model very successfully over the last 3 years with the detection of over 90% of the ketosis cases (over 10 million IR spectra collected)

- More frequent sampling protocol should be considered during early lactation to further improve diagnostic performance.

BENTLEY INSTRUMENTS

Thank you for your attention!

pbroutin@bentleyinstruments.com
www.bentleyinstruments.com

References

Broutin,P. 2013
Determination of the concentration of a component in one fluid of an animal by spectroscopic analysis of another fluid.
Patent WO 2015/055966

Duffield, T.F., D.F.Kelton,
Chain Fatty Acids in Milk Fat of Multiparous Subclinical Ketotic Cows

E. Knapp, F. Lessire,O. Dotreppe, J.L. Hornick, L. Istasse, I. Dufrasne
Farah, Vet, Faculty, University of Liege, Belgium
Link between milk fatty acids and non esterified fatty acids in the blood and its implication on the diagnosis of negative energy balance.

Hostens, M., V. Fievez, J.L.M.R. Leroy, J. Van Ranst, B. Vlaeminck, and G. Opsomer.2012.
The fatty acid profile of subcutaneous abd abdominal fat n dairy cows with left displacement of the abomasum.
J. Dairy Sci. 95/3756-376574

S. Jorjong,* A. T. M. van Knegsel,† J. Verwaeren,‡ R. M. Bruckmaier,§ B. De Baets,‡ B. Kemp,†
and V. Fievez.
Milk fatty acids as possible biomarkers to diagnose hyperketonemia in early lactation
J. Dairy Sci. 98:5211–5221, http://dx.doi.org/10.3168/jds.2014-8728

Van Haelst, Y.N.T., A. Beeckman, A. T. M. Van Knegsel, and V. Fievez. 2008
Short Communication: Elevated Concentrations of Oleic Acid and Long-Chain Fatty Acids in Milk Fat of Multiparous Subclinical Ketotic Cows
J. Dairy Sci. 91:4683–4686

Dedicated Analytical Solutions

DIFFERENTIAL SOMATIC CELL COUNT – A NEW BIOMARKER FOR MASTITIS SCREENING

Dr. Daniel Schwarz, FOSS, Denmark

AEOS-Ruminantia Conference,
Rome, 23 March 2017

CENTRAL MILK TESTING

- Solutions in operation in 80+ countries
- 3,000+ MilkoScan™ sold (7 generations)
- 3,000+ Fossomatic™ sold (7 generations)
- 1,200+ BactoScan™ sold (3 generations)
- Solutions in compliance with international and national standards (e.g. IDF/ISO, EU, FDA/NCIMS)

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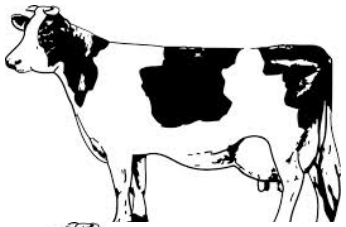
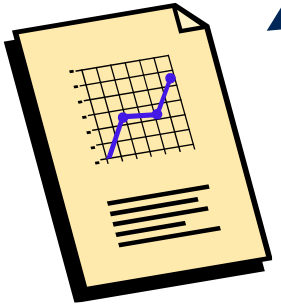
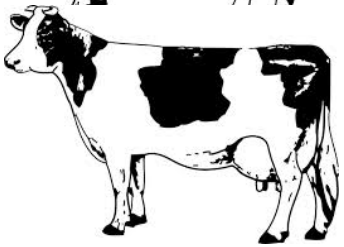
DHI TESTING CHAIN

Milk-testing laboratory







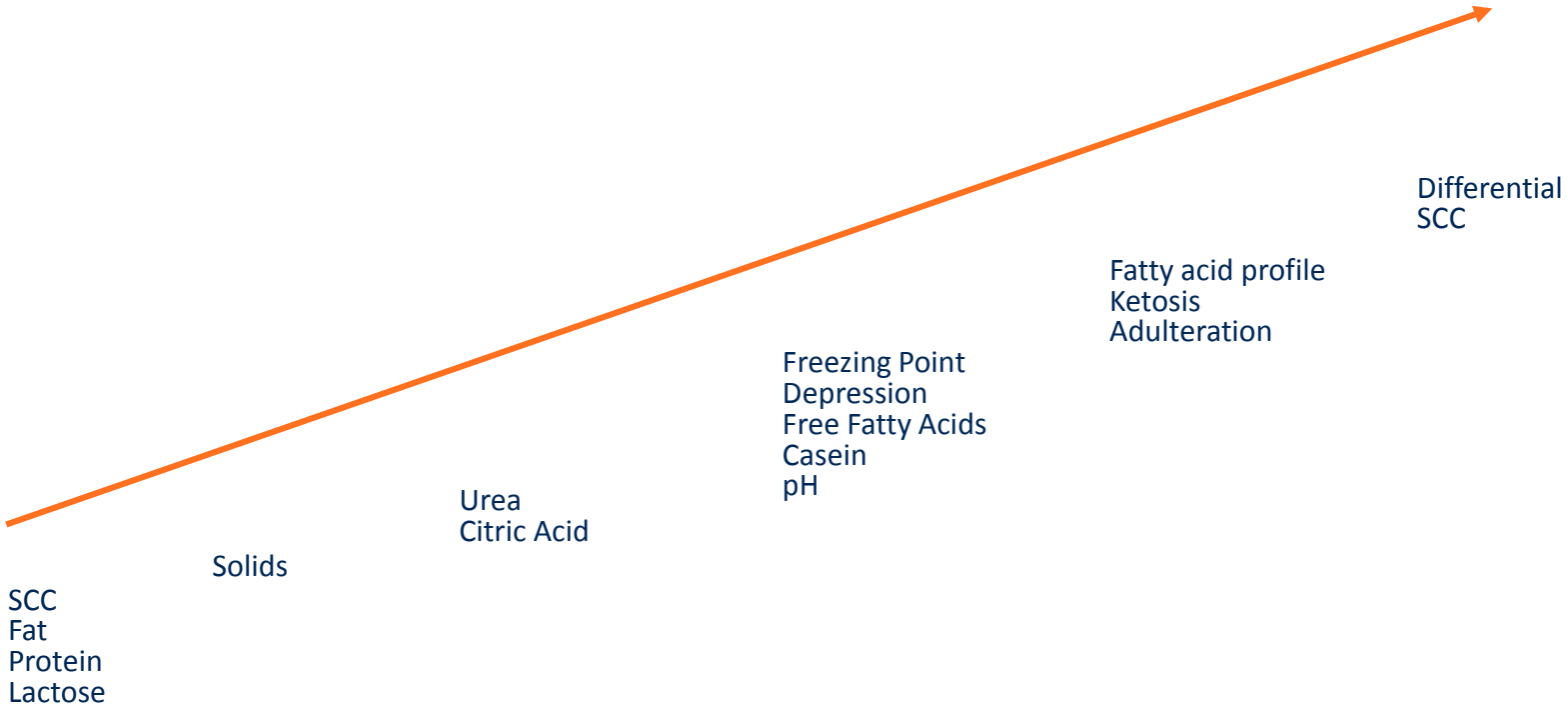
Dairy farm

FOSS

THE NEW COMBIFOSS 7

FOSS

7TH GENERATION COMBIFOSS



CF 215	CF 360	CF 4000	CF 5000	CF 6000	CF FT+	CF 7
1970s	1980s	1980s	1990s	2000s	2010s	2016

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7TH GENERATION COMBIFOSS

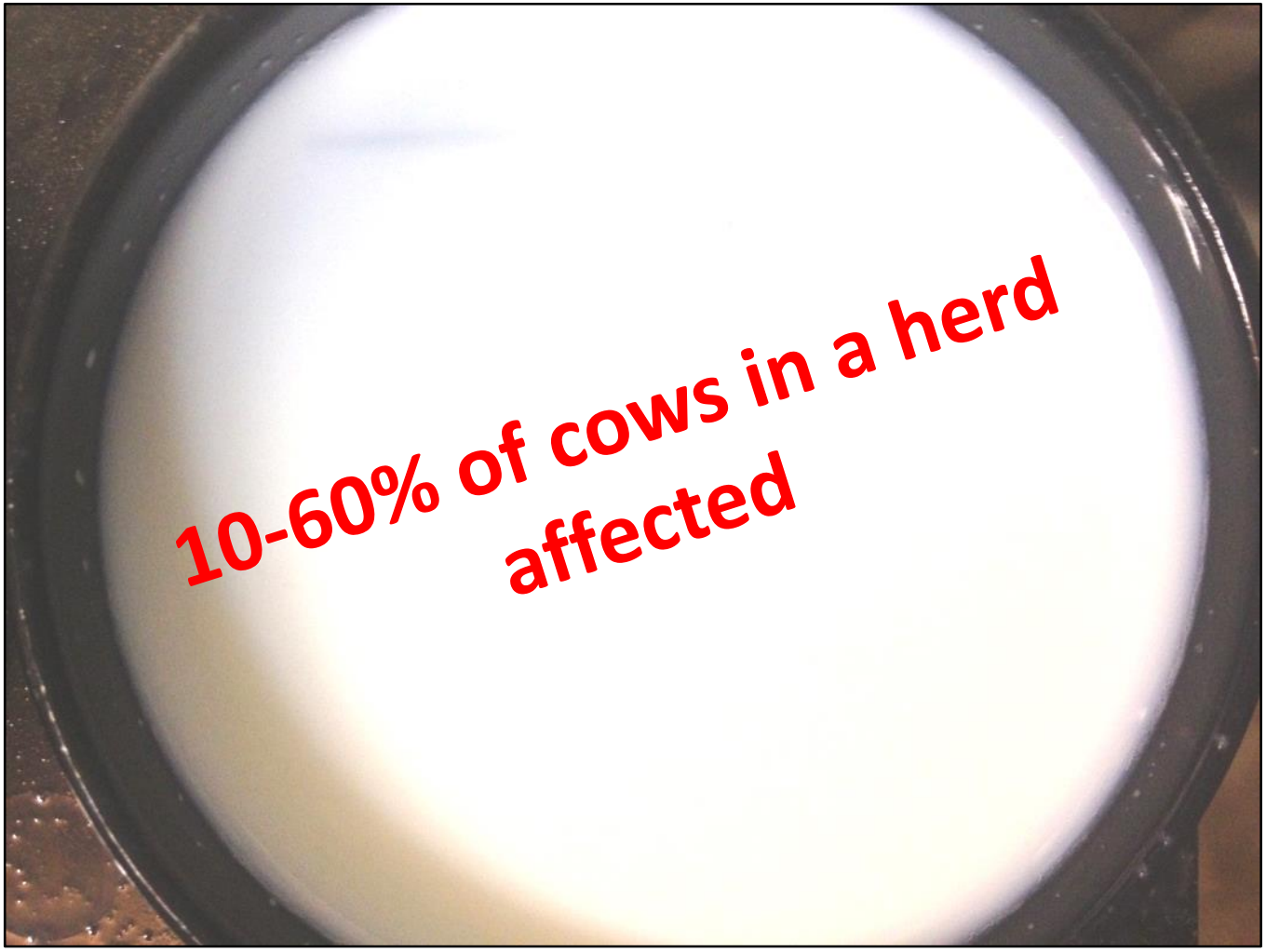
19 parameters in **6sec.**

- ✓ Citric Acid
- ✓ Urea
- ✓ Solids Non Fat
- ✓ Total Solids
- ✓ Lactose
- ✓ Casein
- ✓ Crude Protein
- ✓ True Protein
- ✓ Fat
- ✓ Diff. Somatic Cell Count
- ✓ Somatic Cell Count
- ✓ Adulteration
- ✓ BHB –Ketosis
- ✓ Acetone – Ketosis
- ✓ Fatty Acid Profile 2
- ✓ Fatty Acid profile 1
- ✓ PH
- ✓ FPD
- ✓ Free Fatty Acids

FOSS

Differential Somatic Cell Count and Mastitis Screening

SUBCLINICAL MASTITIS



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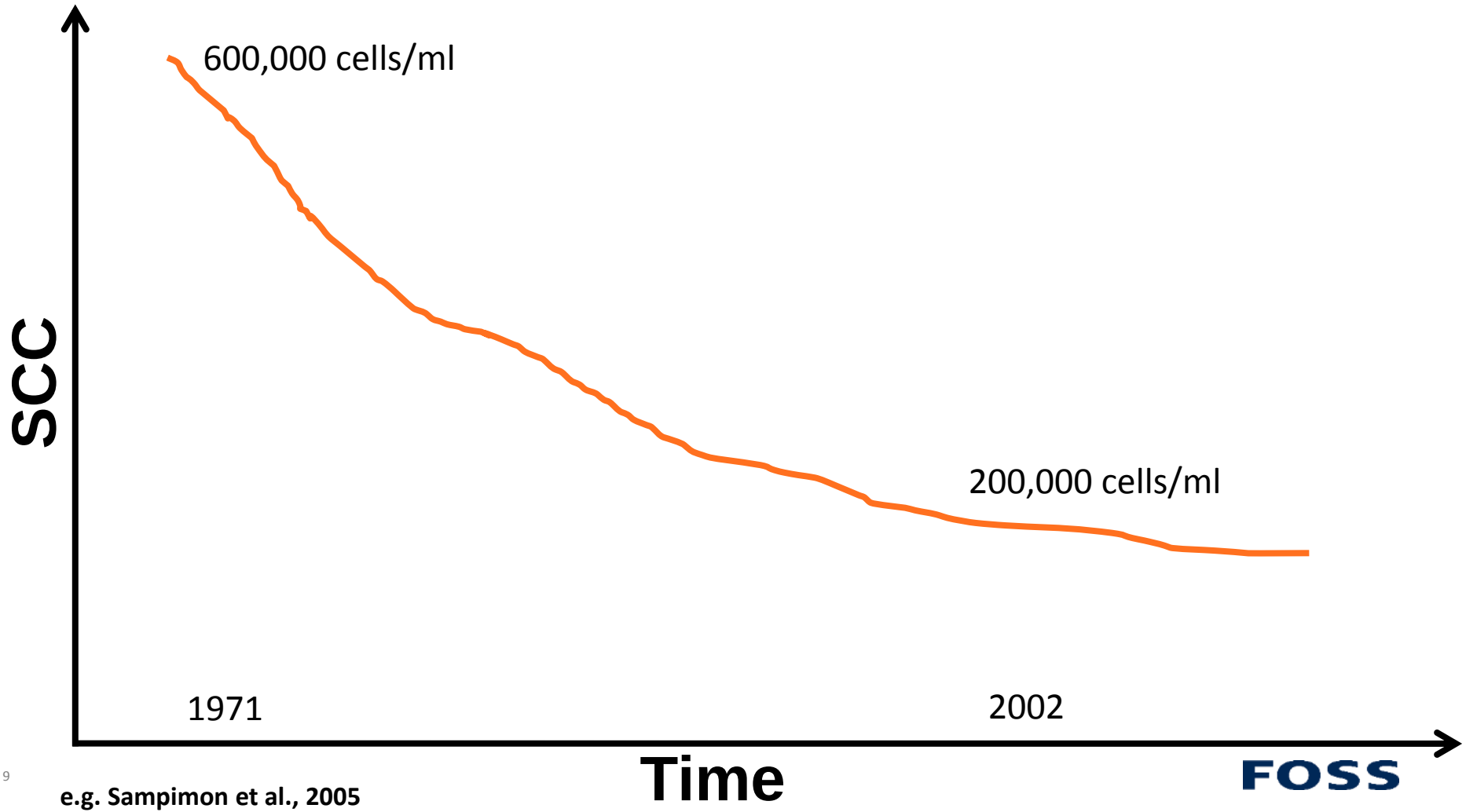
DEVELOPMENT OF UDDER HEALTH



e.g. Sampimon et al., 2005

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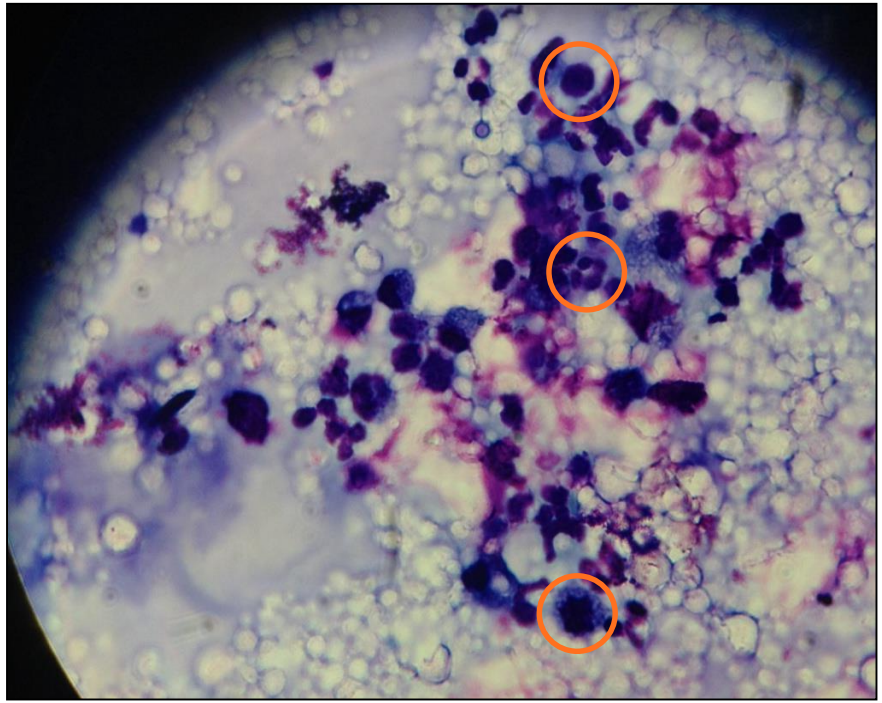
ECONOMIC LOSSES

CELLS IN MILK

1. **Lymphocytes**
2. **Polymorphonuclear neutrophils (PMN)**
3. **Macrophages**



Microscope spot, milk slide

Sordillo and Nickerson, 1988; Nickerson, 1989; Paape et al., 2002; Oviedo-Boyso et al., 2007

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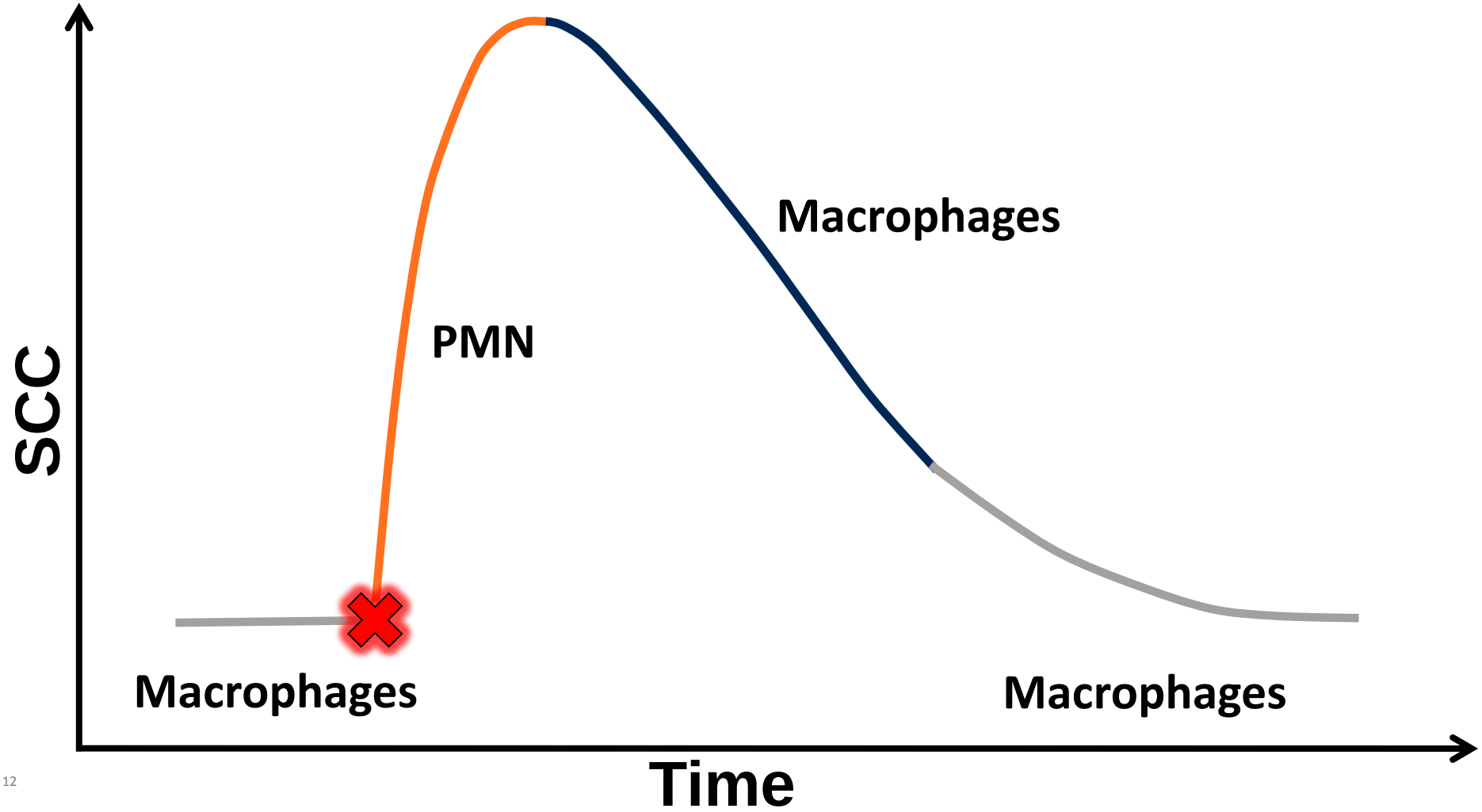
MASTITIS CASCADE



THE NEW FOSSOMATIC 7 DC

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THE FOSS DSCC METHOD

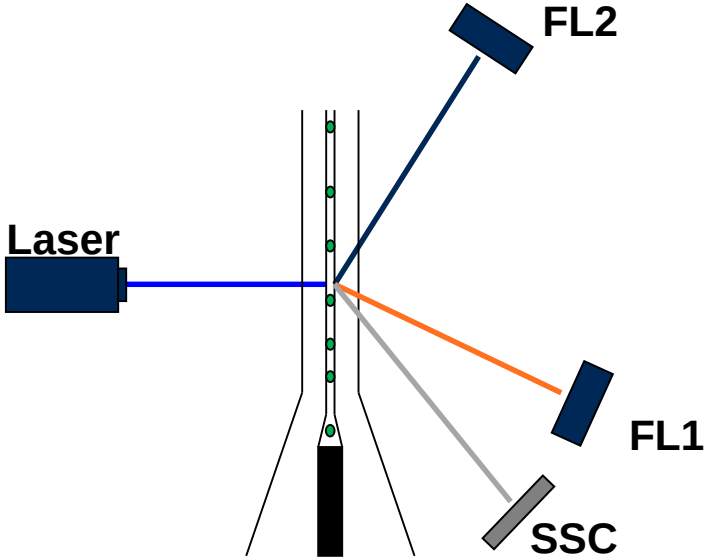
New measuring unit

New chemistry

+

+

Incubation unit



Patented technology

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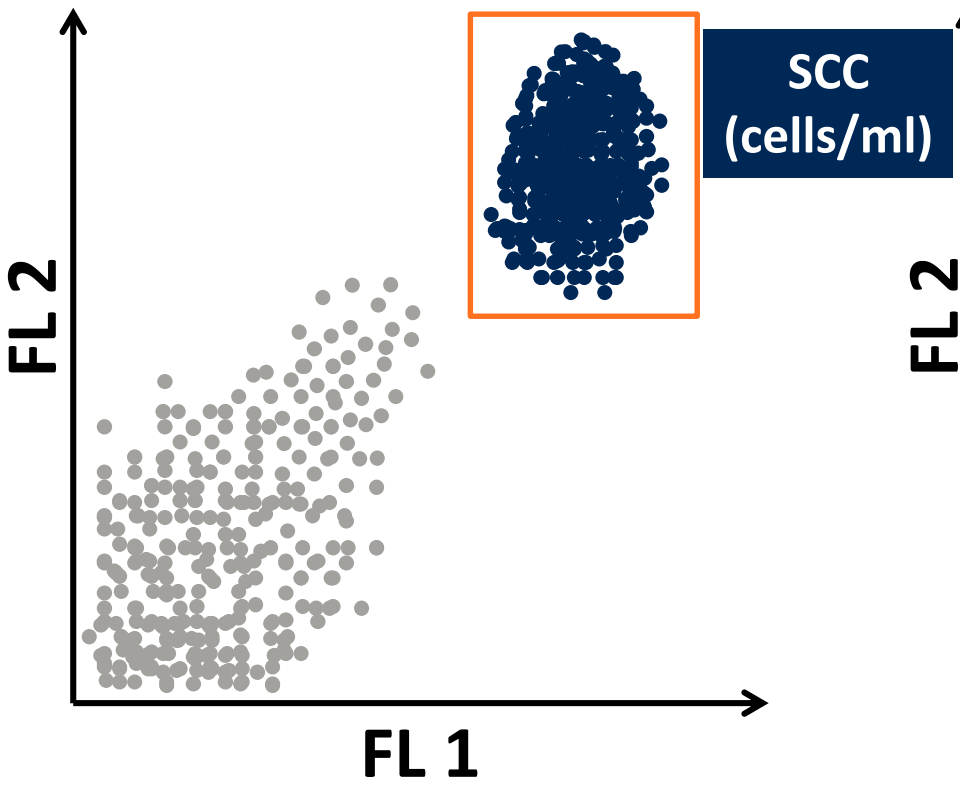
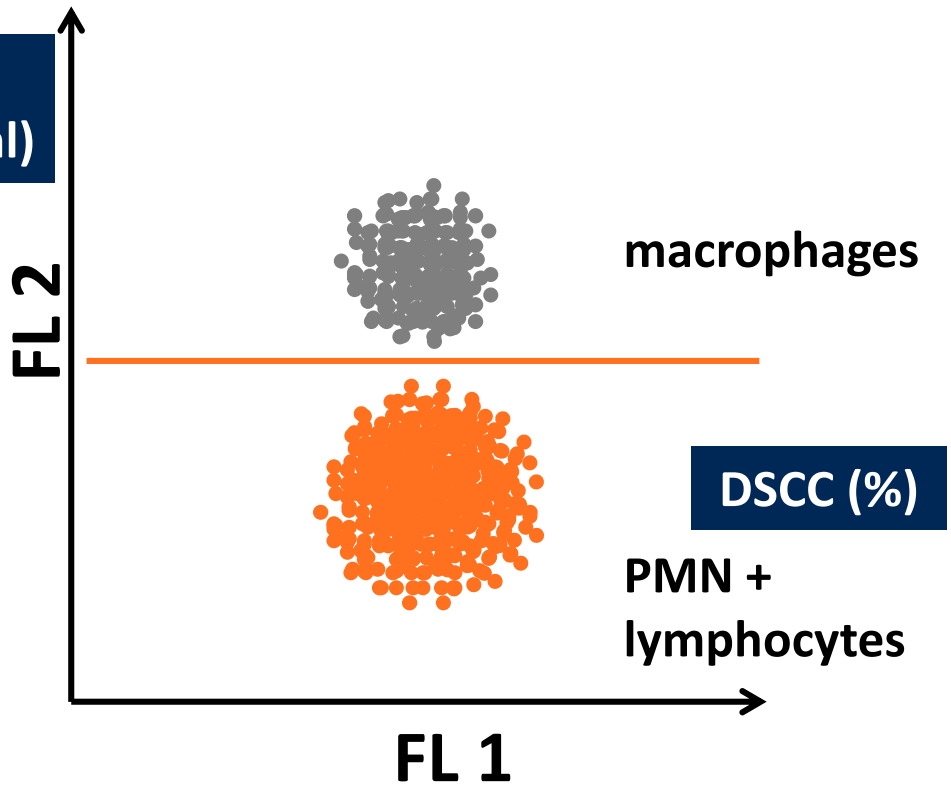
THE FOSS DSCC METHOD

Analysis of SCC



Analysis of DSCC



SSC information used supportively for determination of SCC

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DIFFERENTIAL SCC (DSCC)

New opportunities in mastitis management

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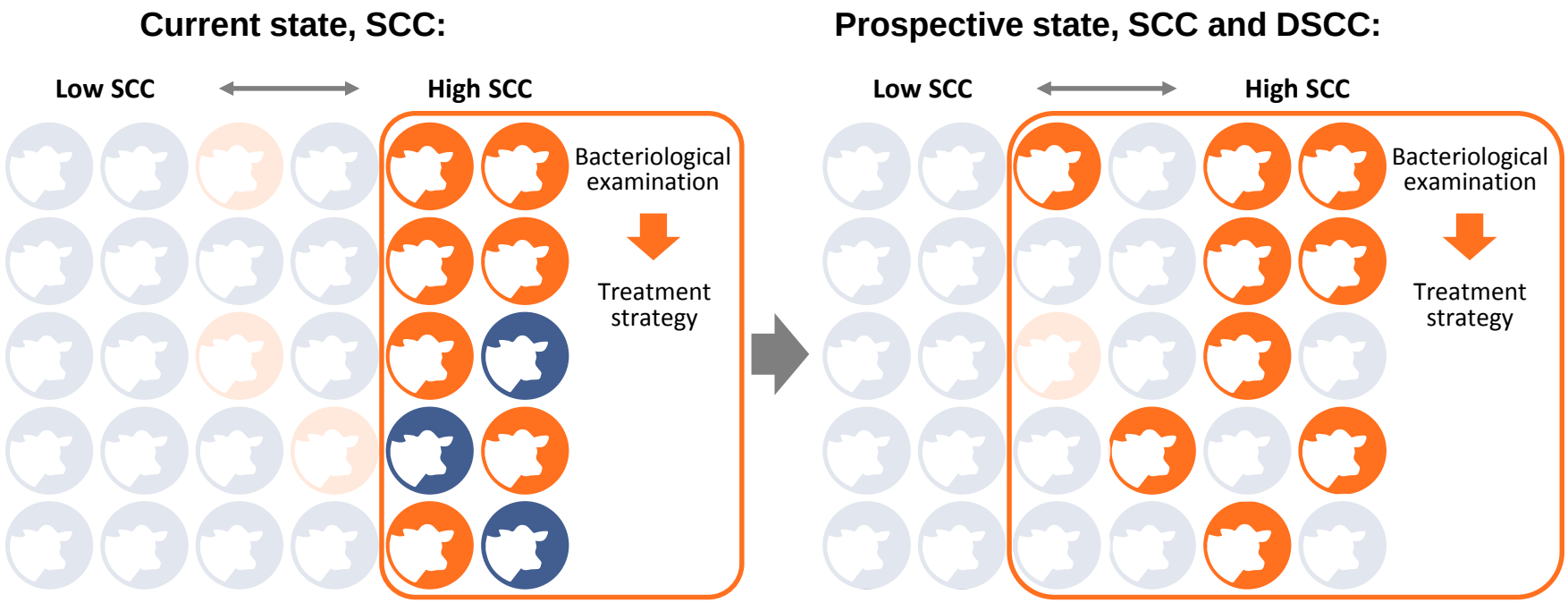
ENHANCED TOOL FOR MASTITIS MONITORING

Targeted selection of suspicious cows



Healthy Infected

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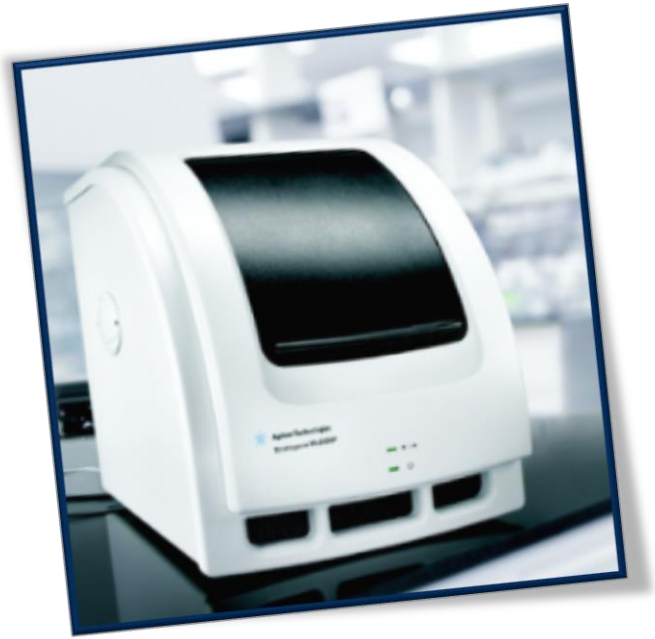
IMPROVED BACTERIOLOGICAL EXAMINATION



- Targeted selection
- Better interpretation

IDEA

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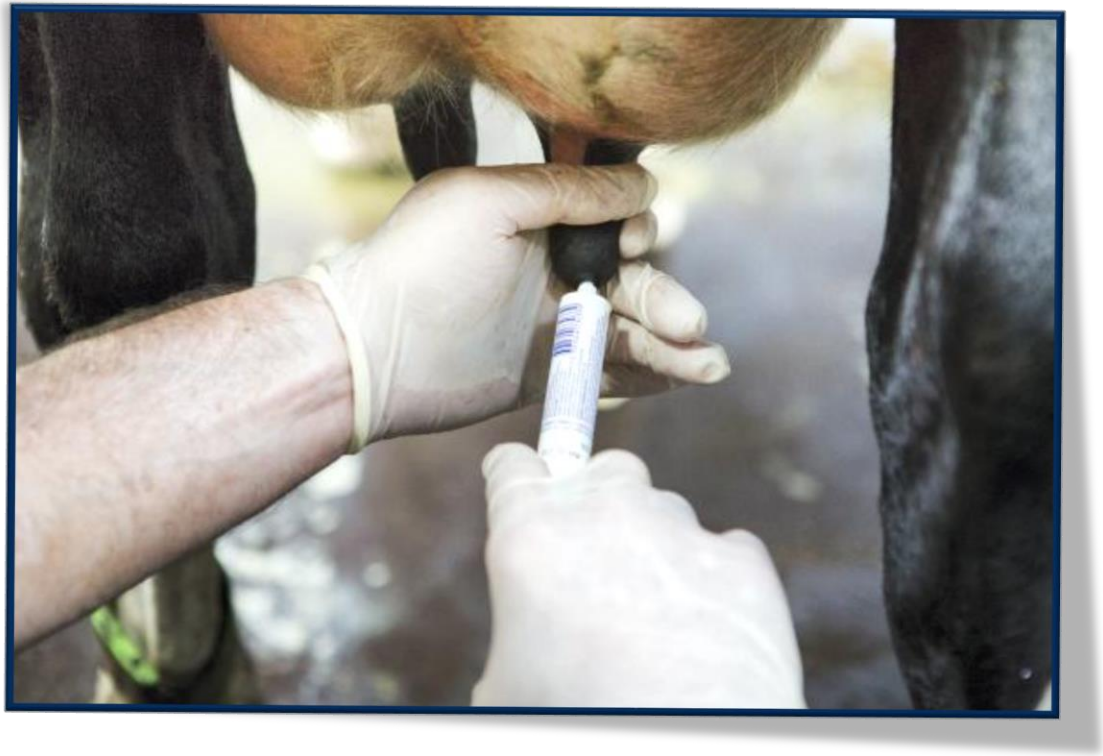
USE OF ANTIBIOTICS AT DRY OFF



IDEA

- Improved decision tool

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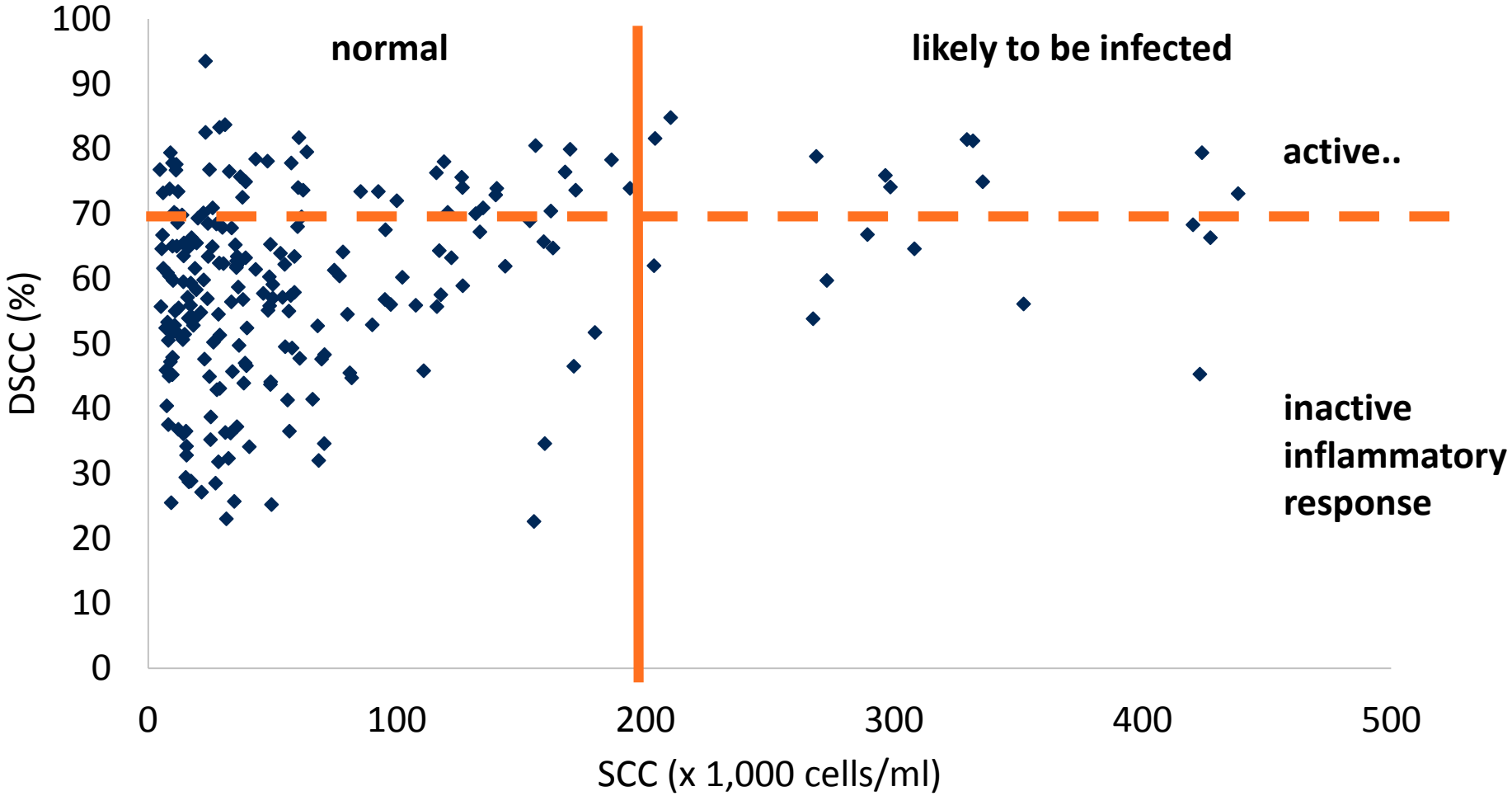
EXAMPLE FOR DSCC DATASET



DSCC RESEARCH IN PROGRESS

- 3-year projects in

- Microbiological testing
- Development of guidelines

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MORE DSCC RESEARCH PROJECTS

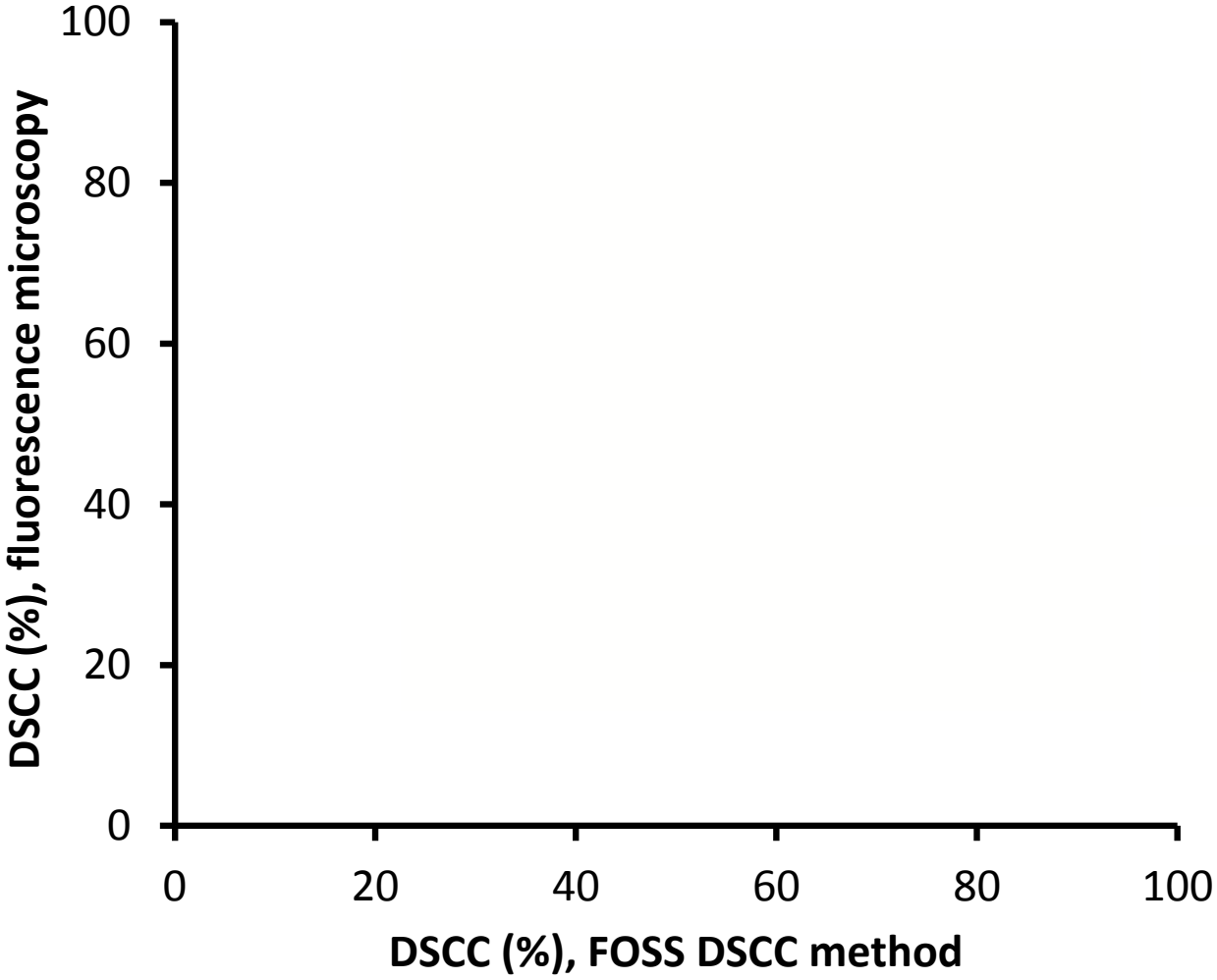
Project	Objective	Status
University 1	DSCC before, during, and after artificial intramammary infection of cows under controlled conditions	Data analysis
University 2	Value of DSCC for selective dry cow therapy	Data analysis
DHI laboratory, North America	Investigation of correlation between DSCC and udder health status in a longitudinal study	Kick-off: March 2017
DHI laboratory, North America	DSCC for enhanced analysis of udder health in fresh lactating cows	Kick-off: March 2017
DHI laboratory, Europe	DSCC as parameter for improved microbiological testing	Kick-off: May 2017
DHI laboratory & universities, Europe	DSCC as indicator for prediction of the recovery phase after mastitis	Kick-off: October 2017

A MESSAGE TO TAKE HOME

- First high-throughput analyser for DSCC
- DSCC (%) = PMN + lymphocytes
- More information on actual inflammatory status
- New possibilities to further tackle mastitis

@SchwarzD123 @FOSSAnalytical

SPECIFICITY OF THE DSCC METHOD



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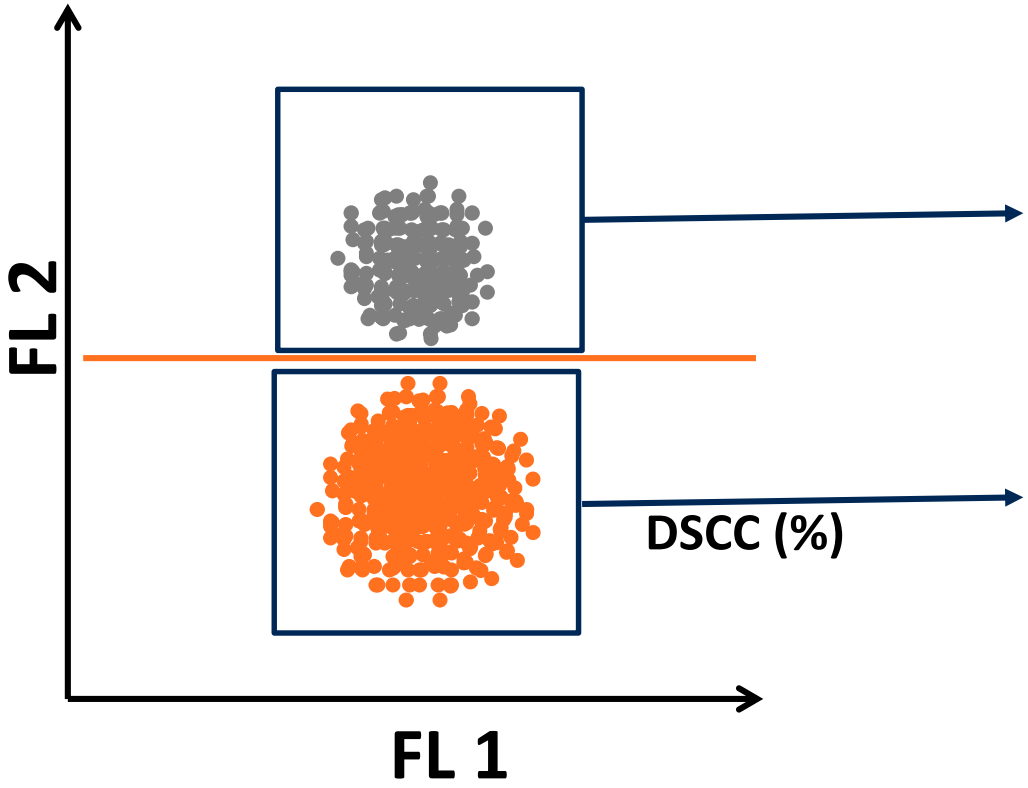
ACCURACY OF THE DSCC METHOD

Analysis of DSCC



94% macrophages

83% PMN + lymphocytes

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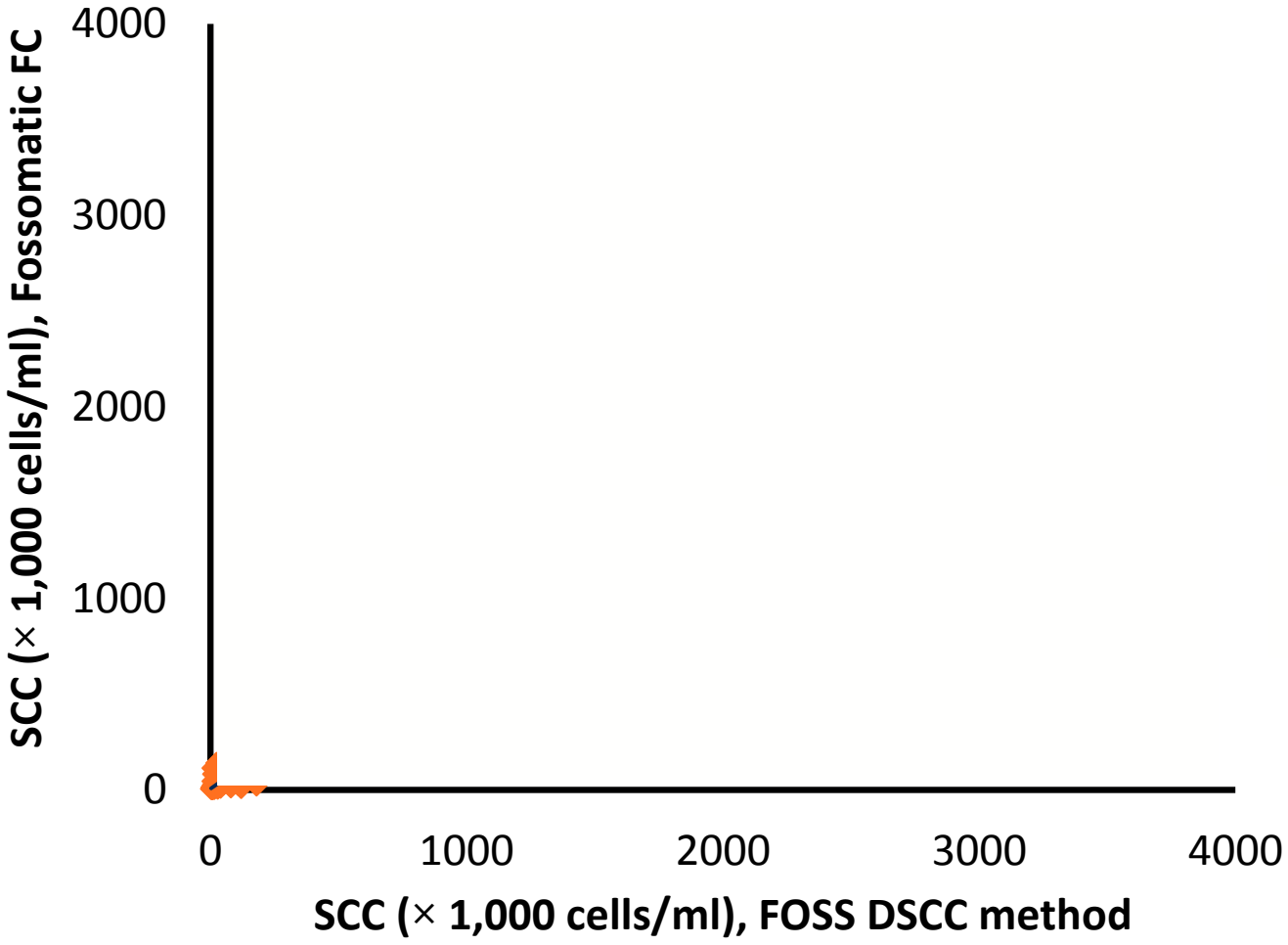
SCC REFERENCE



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1° Convegno Analisi Lattiero Casearie

"Presente e futuro delle potenzialità offerte

dai parametri analitici del latte"

Nuovi approcci nella preparazione del campione per la quantificazione di Aflatossina M1 nei derivati del latte

G. Papageorgiou, Ch. Tsaridou, K. Badra, Ch. Chatzoglou, N. Natsaridis, A.N. Ntantasios and **S.D. Athanasiou**

Dipartimento di Ricerca e Sviluppo

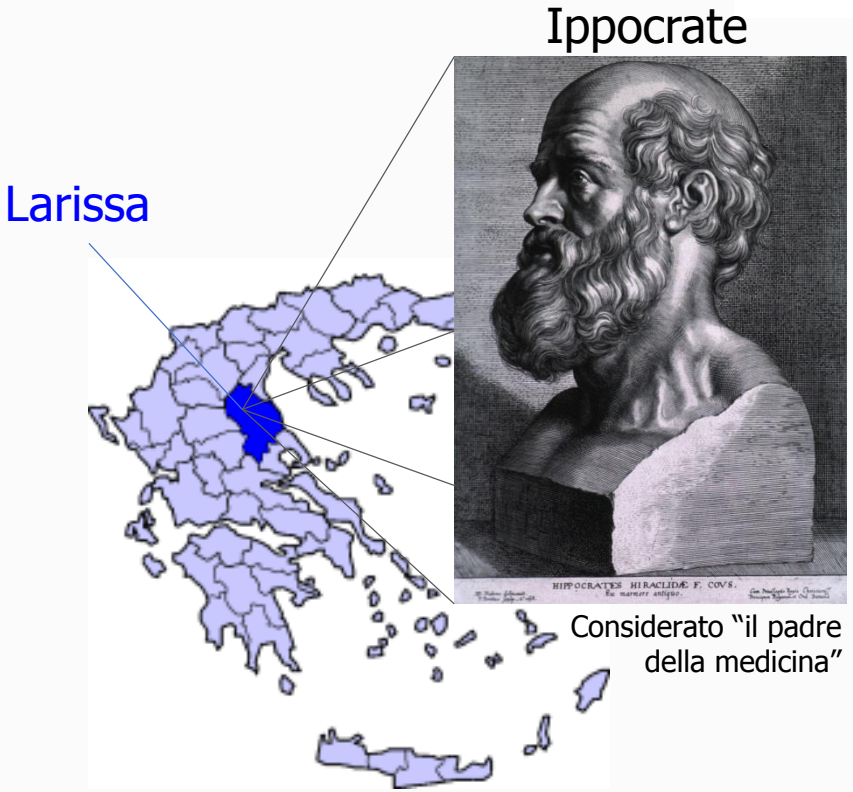
OR SELL SRL

CONTROLLA GLI ALIMENTI

PROGNOSIS BIOTECH

PROGNOSIS BIOTECH

- un'azienda biotecnologica innovativa, situata nella Grecia centrale, nella città di Larissa
- specializzata nello sviluppo di diagnostica in vitro per la Sicurezza Alimentare ma anche nella fabbricazione e nel marketing di prodotti diagnostici e di laboratorio



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TÜV HELLAS Member of TÜV NORD Group

BIO-SHIELD

RAPID TEST

REUSE REDUCE RECYCLE

PROGNOSIS BIOTECH

- Il catalogo dei nostri prodotti comprende: test ELISA e test lateral flow per le micotossine e l'adulterazione del latte
- Progettiamo i nostri processi in modo che i nostri prodotti siano affidabili, facili da usare e rispettino l'ambiente
- In cosa Prognosis Biotech è diversa? «Ogni prodotto è il risultato di una ricerca per l'innovazione»

- Aflatossina M1
- Aflatossina B1
- Aflatossine totali
- Ocratossina
- Deossinivalenolo
- Zearalenone
- Fumonisine
- Adulterazione del latte

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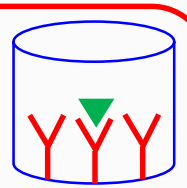
BIO-SHIELD

RAPID TEST

REUSE REDUCE RECYCLE

Prodotti per l'analisi di Aflatossina M1 (Limite EU)

100µl/pozzetto di standard e campioni



Incubazione 45min

4 lavaggi

100µl/pozzetto di Soluzione di Rilevazione

Incubazione 15min

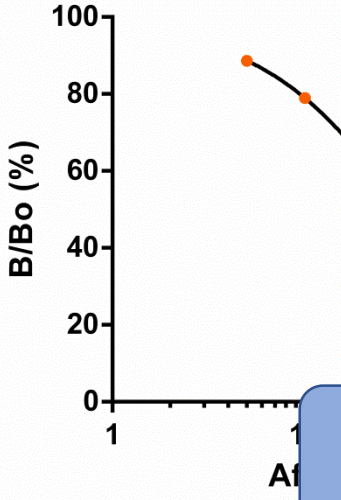
4 lavaggi

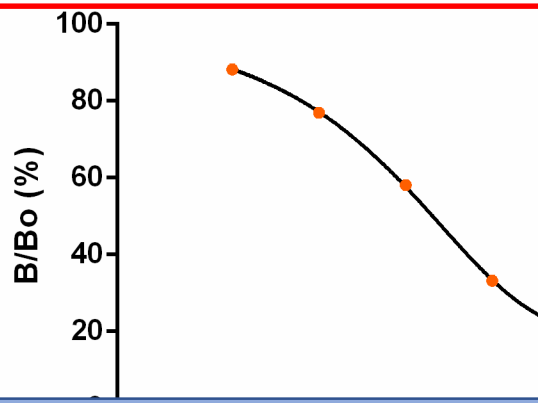
100µl/pozzetto del Substrato TMB

Incubazione 15min

100µl/pozzetto di Soluzione di Stop

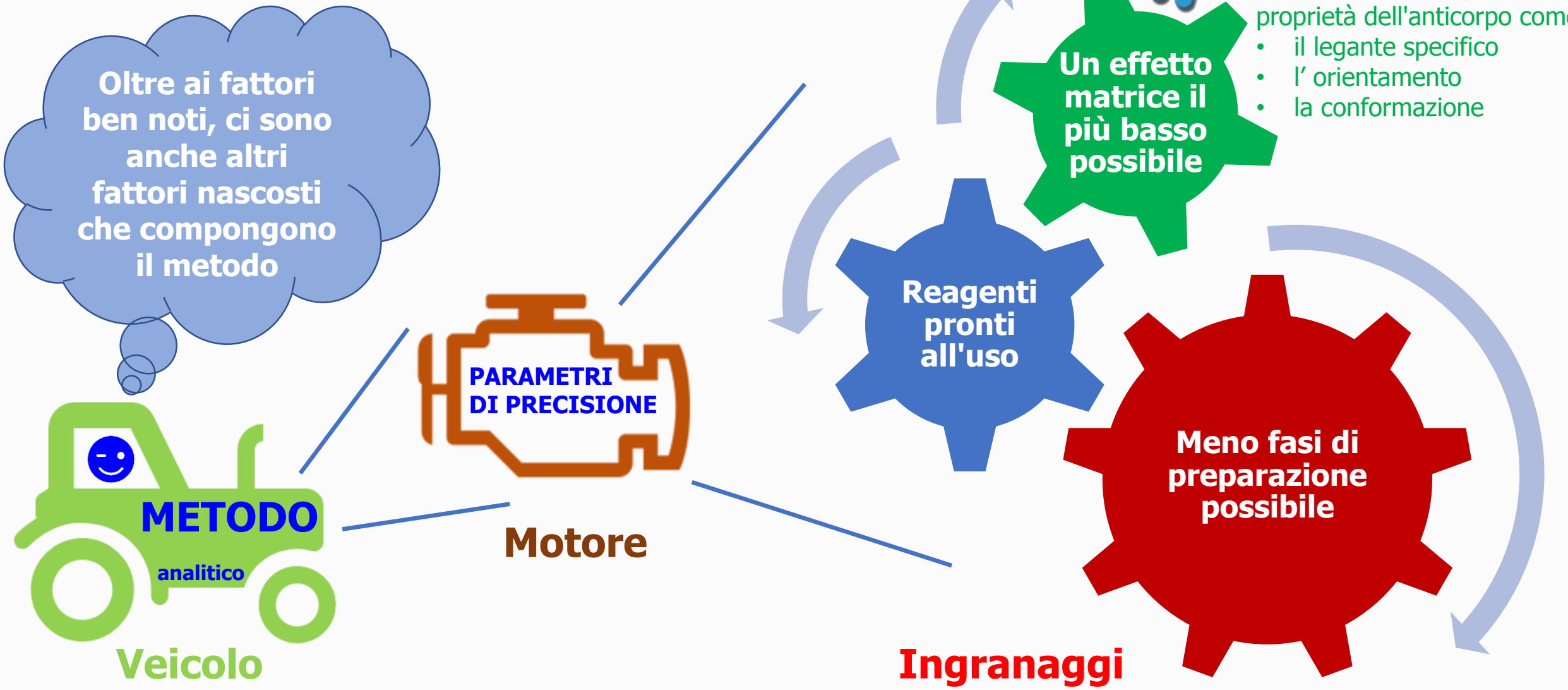
BIO-SHIELD	M1 Extra Sensitive (ES)	M1 Baby Food (BF)
	Sono conformi alla ISO 14675:2003	
	Sono immunoenzimatici competitivi	
Tempo di saggio	75min (45-15-15min)	
Intervallo	0-250ppt	0-80ppt
LOD	2ppt	1.6ppt
		0.1%
		t





Cosa possiamo dire dei parametri di precisione?

Parametri di Precisione



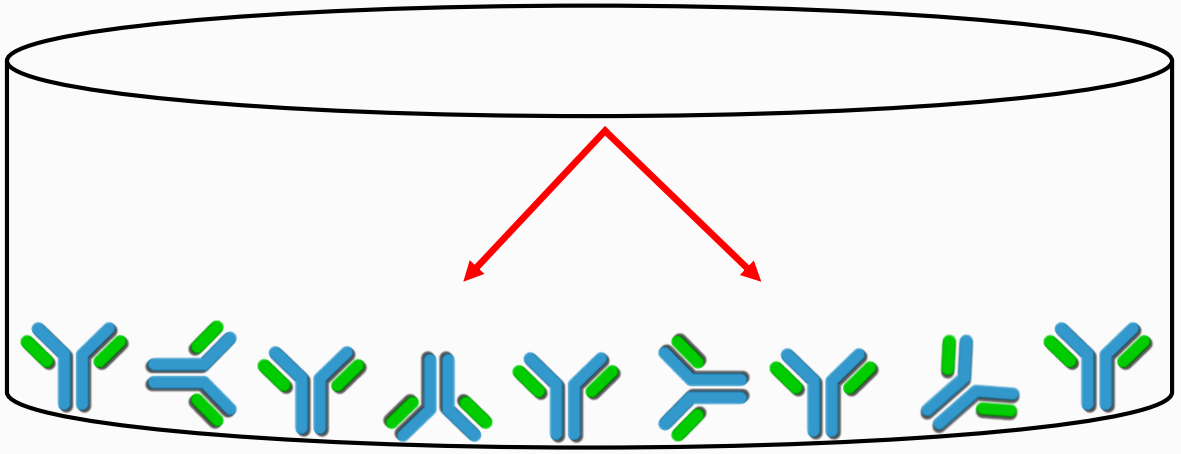
L'effetto matrice dipende dalle proprietà dell'anticorpo come

- il legante specifico
- l' orientamento
- la conformazione

Un effetto matrice il più basso possibile

L'orientamento dell'anticorpo

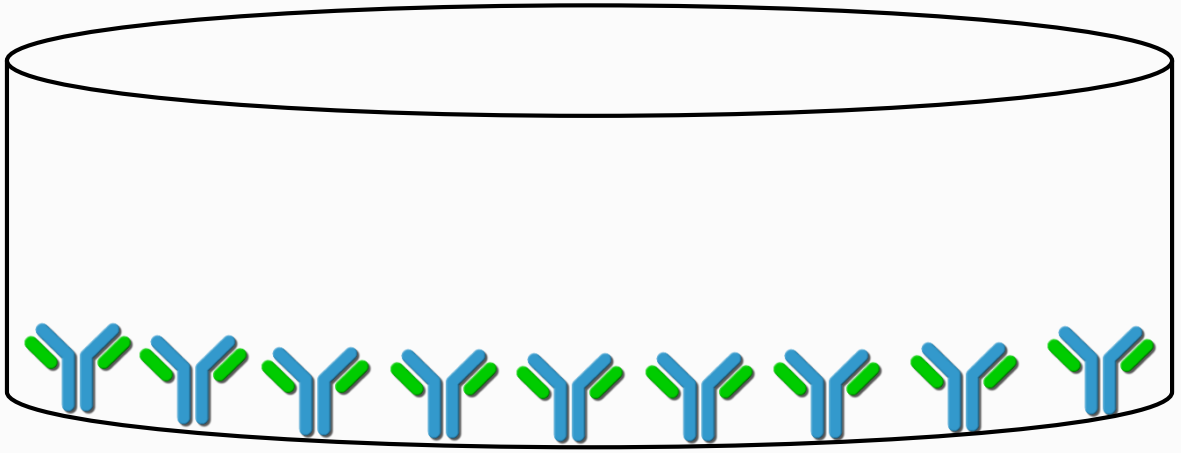
Coating tradizionale



Pozzetto ELISA

- Gli anticorpi hanno tutti un orientamento casuale, mentre la maggior parte rimane inattiva

Coating "manipolato"



Pozzetto ELISA

- Gli anticorpi possono avere, un'attività legante ottimale

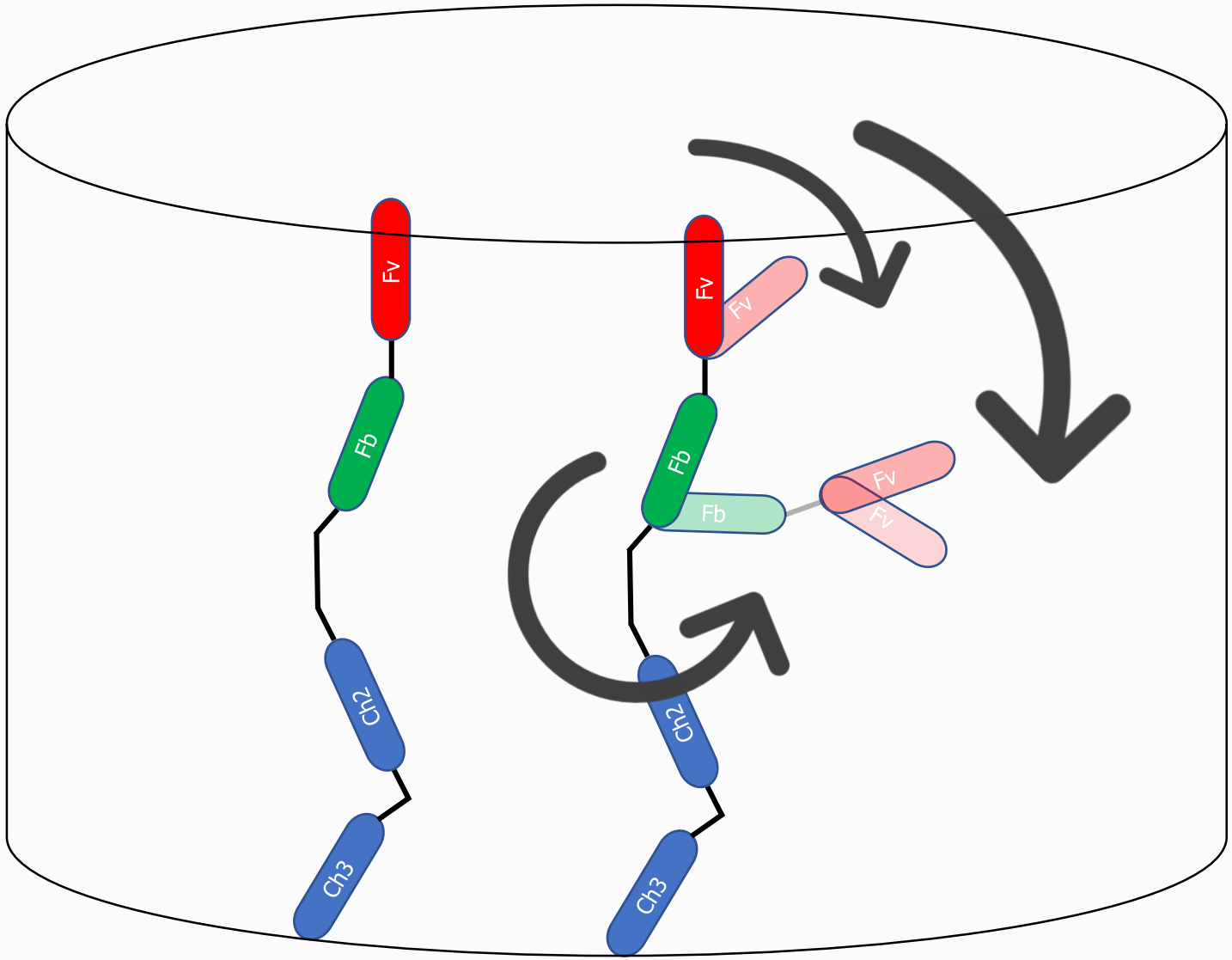
Un effetto matrice il più basso possibile

La conformazione dell'anticorpo

In più, è importante che gli anticorpi abbiano una conformazione particolare. Questo può avvenire grazie all'utilizzo di uno specifico stabilizzante per coating che

1. Ristabilisce la corretta conformazione degli anticorpi presenti

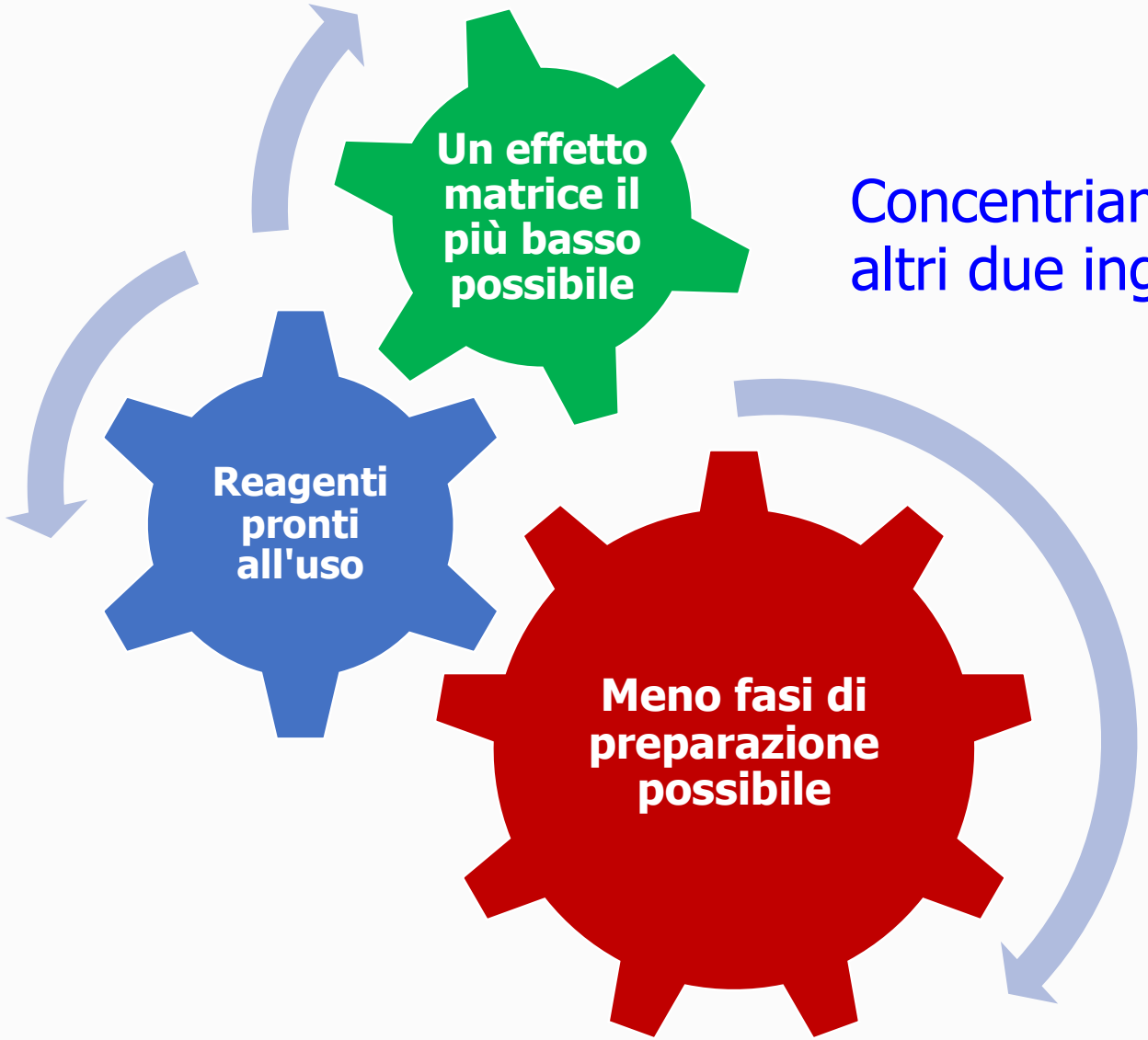
2. Mantiene la corretta conformazione durante lo stoccaggio del kit



Pozzetto ELISA

Parametri di Precisione

Tutti i reagenti dei nostri metodi sono pronti all'uso



Concentriamoci quindi sugli altri due ingranaggi

Analisi dello yogurt

Meno fasi di preparazione possibile

Preparazione

Metodo Prognosis per yogurt

1g di yogurt

0.5ml di H_2O

1.5ml di Buffer

Vortex

100µl

Con questo buffer la miscela finale è compatibile per il test immunoenzimatico è può essere utilizzata direttamente nei micropozzetti

Test ELISA

- Fattore di diluizione: 3
- LOQ: 15ppt

Met radizionale

1 anolo

gazione
min

zione

ne

Riposo
5min

Ovviamente avevamo pensato anche di miscelare il buffer con l'acqua per ottenere una soluzione pronta all'uso, ma ci siamo prima posti il problema di un'elevata diluizione nel caso dello yogurt da bere

- Fattore di diluizione: 5
- LOQ: 25ppt

Analisi dello yogurt da bere

Meno fasi di preparazione possibile

Preparazione

Metodo Prognosis per yogurt da bere

1g di yogurt da bere

1ml di Buffer

Vortex

100µl

- Fattore di diluizione: 2
- LOQ: 15ppt

Metodo tradizionale

5ml di Metanolo

Centrifugazione 5min

Evaporazione

Diluzione

Riposo 5min

- Fattore di diluizione: 5
- LOQ: 25ppt

La cosa più importante però è che non usiamo il metanolo

In entrambi i due casi, rispetto ai metodi tradizionali, evitiamo il processo di centrifugazione, quello di evaporazione ed il tempo di riposo della soluzione finale

Test ELISA

Un effetto matrice il più basso possibile

Recovery di campioni di Yogurt e Yogurt da bere

E per quanto riguarda la recovery dei campioni spikati?

		Campioni Testati per Lotto (n)	Numero di Lotti Diversi Usati	Recovery Media	CV
Yogurt negativi (bianchi) spikati con Aflatossina M1 in tre livelli: 75, 150 e 225ppt	Yogurt greco vaccino	8	3	96.20%	7.46%
	Yogurt di latte vaccino intero	8	3	96.00%	8.27%
	Yogurt di latte ovino intero	8	3	102.73%	8.67%
	Media			**98.31%**	
Yogurt da bere negativi (bianchi) spikati con Aflatossina M1 in tre livelli: 50, 100 e 150ppt	Ayran			108.34%	3.15%
	Kefir			105.46%	5.46%
	Media			**106.90%**	

Come si può notare, sono entrambi risultati eccellenti

Un effetto matrice il più basso possibile

Riassunto campioni di Yogurt e Yogurt da bere

	Metodo Prognosis per Yogurt	Metodo Prognosis per Yogurt da Bere	Metodo tradizionale
Recovery	98.31%	106.90%	60-90%
Fattore di diluizione	3	2	≥5
LOQ Test ELISA	15	10	≥25
Tempo di preparazione	<5 min		≥60 min
Uso di solventi organici / Apparecchiature	NO		SÌ

In combinazione con il fatto della non necessità di impiego di solventi organici e qualsiasi strumentazione, è ovvio che questo protocollo costituisce uno strumento prezioso nell'analisi dei campioni di yogurt

Analisi di campioni di formaggio

Meno fasi di preparazione possibile

Preparazione

Metodo DCM

2g di campione di formaggio

0.5ml di DCM

30min / 25°C

Centrifugaz
10min

Evaporazion

- 0.5ml MetOH
- 0.5ml H_2O
- 2ml Esano

Centrifugazione
10min

Diluizione

- Fattore di diluizione: 10
- LOQ: 50ppt

Metodo Pepsina

2.5g di campione di formaggio

25ml soluzione di Pepsina

Tutta la note / 42°C

zione
n

ltrazione

Diluizione

- Fattore di diluizione: 20
- LOQ: 100ppt

Numero migliore

In entrambi i casi, la chiave che sblocca il miglioramento, è il minor effetto matrice dei nostri test

Test ELISA

Un effetto matrice il più basso possibile

Recovery di campioni di formaggio

Guardiamo ora la recovery per campioni di formaggio spikati

Campione	Campioni Testati per Lotto (n)	Numero di Lotti Diversi Usati	Metodo DCM – LOQ: 50ppt		Metodo Pepsina – LOQ: 100ppt	
			Recovery Media	CV		
Formaggio a pasta dura	8	3	96.77%	6.64%	97.98%	9.08%
Formaggio a pasta semidura	8	3	86.83%	4.79%	92.13%	6.37%
Formaggio a pasta molle	8	3	98.71%	9.17%	96.58%	7.03%
Media			**94.10%**	6.87%	**95.56%**	7.49%

chi) spikati con aflatossina M1 in tre livelli: 250, 500 e 750ppt

È più facile e dà, comunque risultati eccellenti

Ring Test

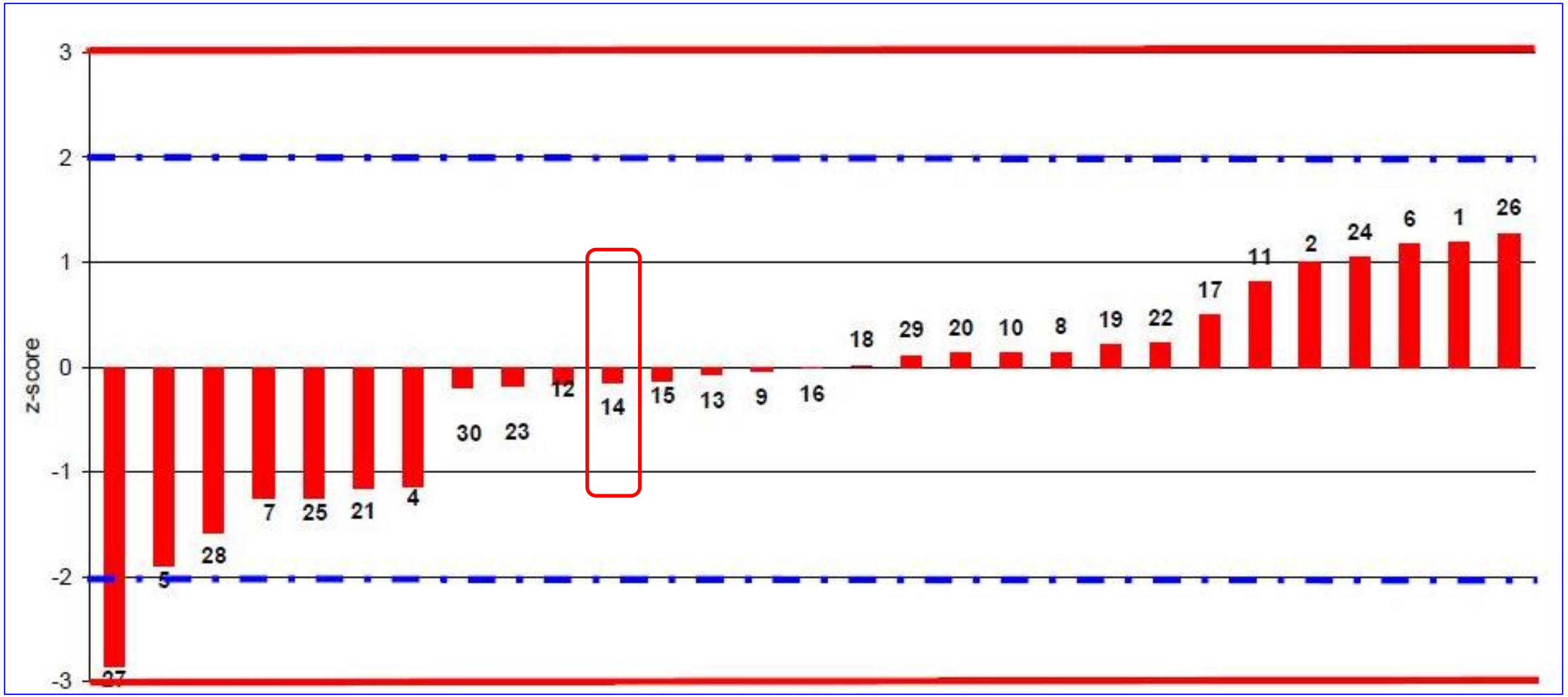
Test	Numero di Laboratorio	Valori Assegn (ng/kg)	ore
A.I.A. Ring Test Lotto RTF M1 251016 Aflatossina M1 nel Formaggio Ottobre 2016	14	331.13	5
		36.26	4

Da notare inoltre che, in entrambi i casi il CV è praticamente lo stesso nonostante il diverso fattore di diluizione

Un effetto matrice il più basso possibile

Ring Test

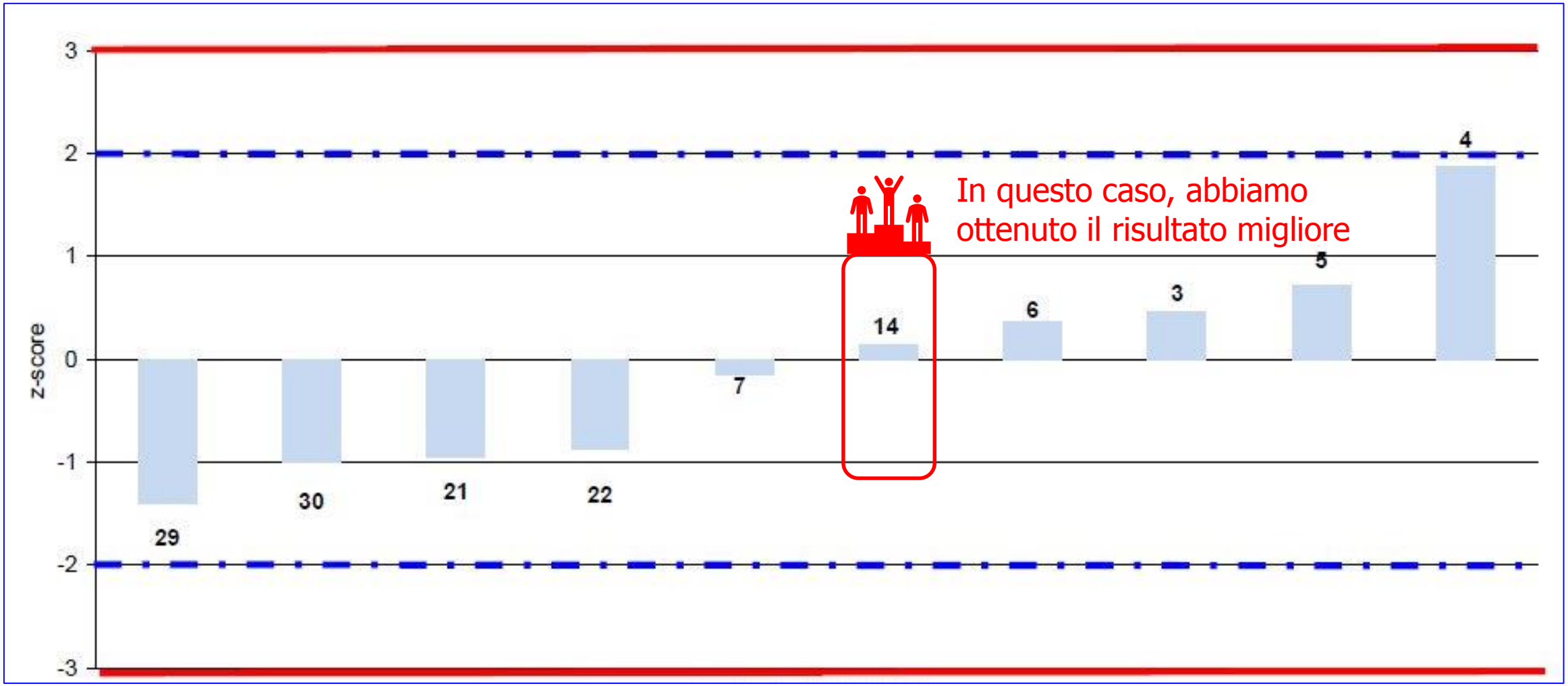
Formaggio 1



Un effetto matrice il più basso possibile

Ring Test

Formaggio 2



Un effetto matrice il più basso possibile

Recovery di campioni di latte

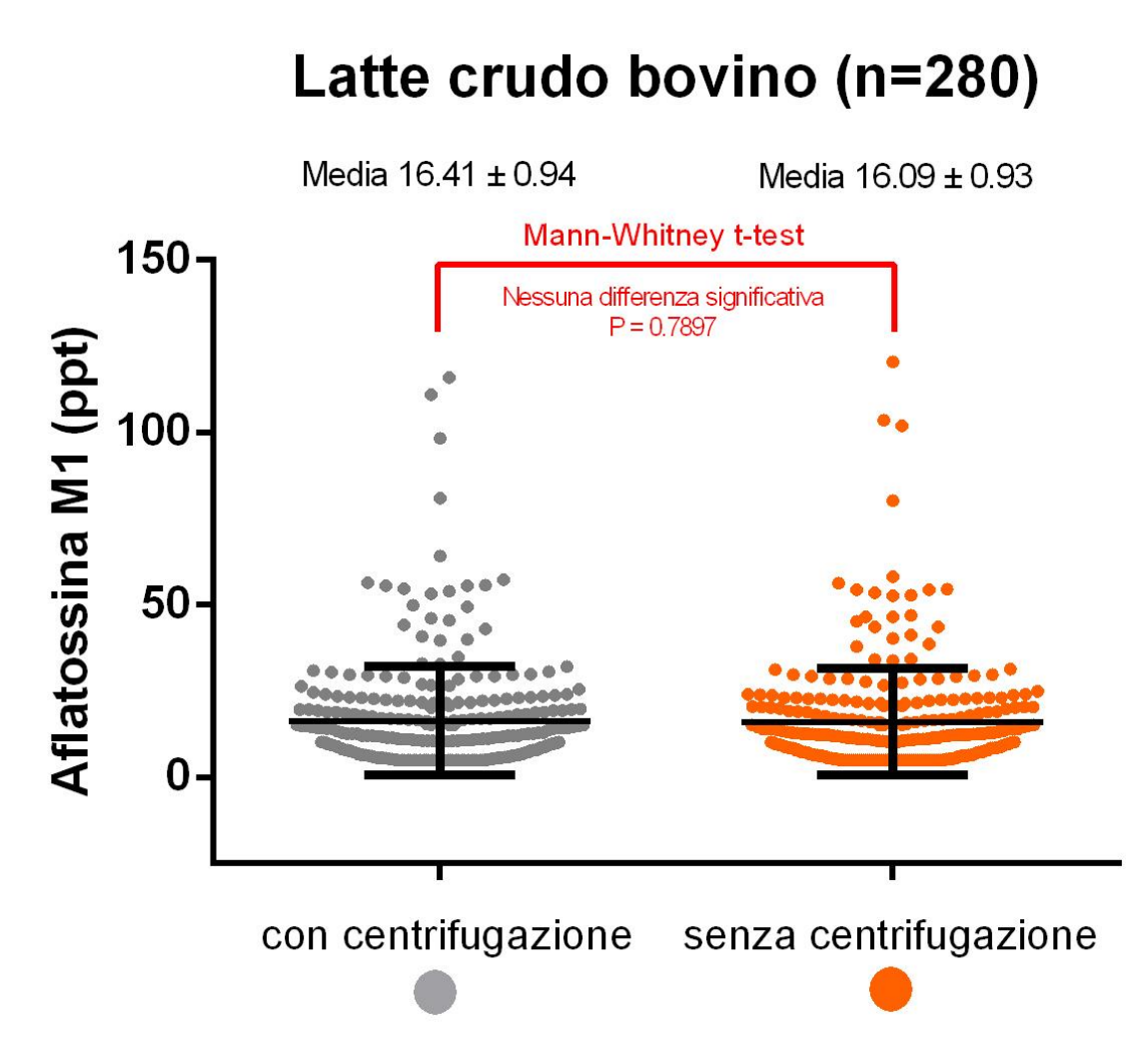
Il basso effetto matrice è stato inoltre confermato dalla recovery di campioni di latte spikati

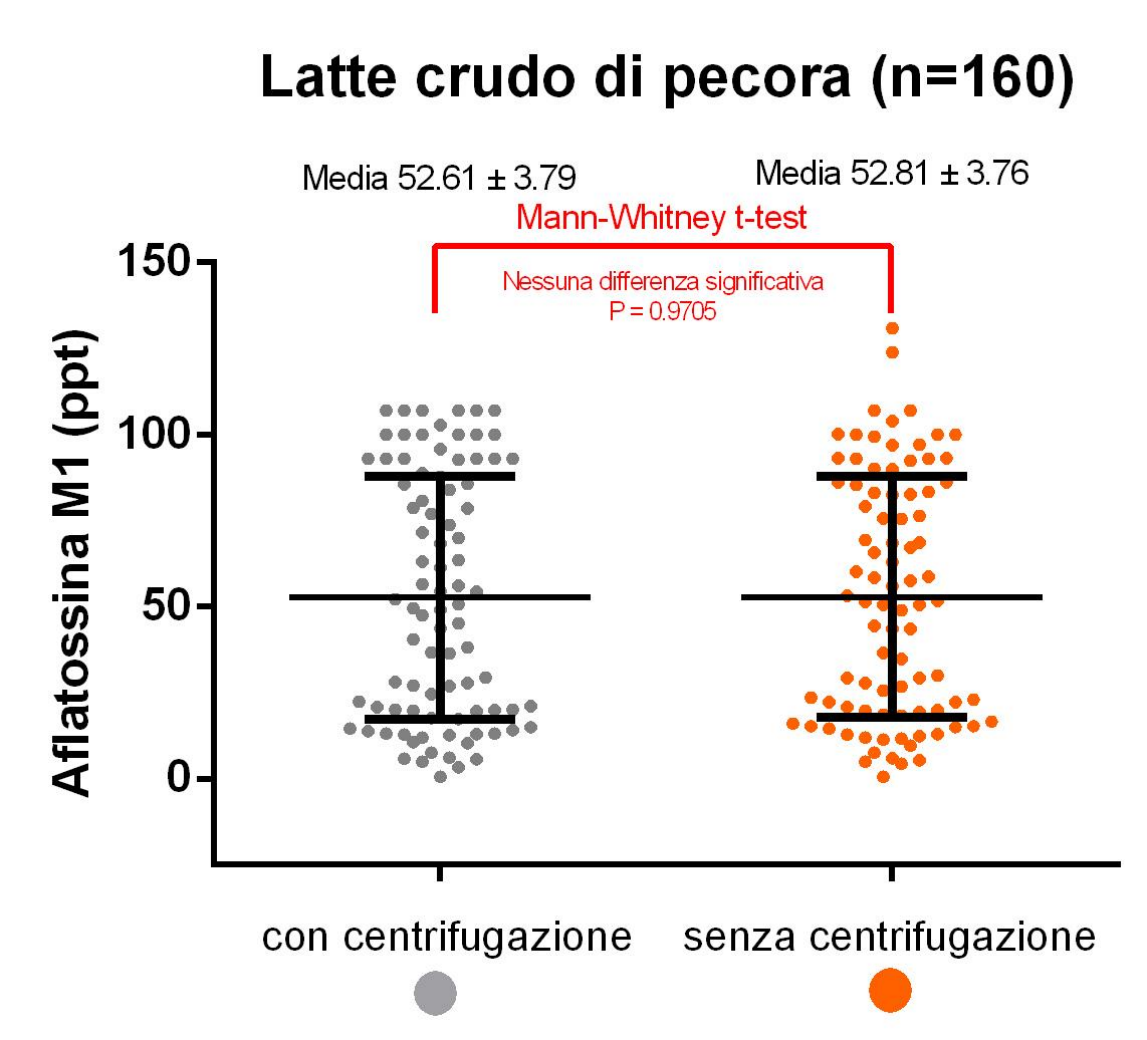
	ni) spikati con aflatossina M1 in tre liveli: 25, 50 e 75ppt			
	ati	Numero di Lotti Diversi Usati	Recovery Media	CV
Latte omogeneizzato	8	3	99.83%	7.10%
Latte crudo scremato	8	3	99.00%	6.18%
Latte crudo intero	8	3	97.93%	5.34%
Media			**98.92%**	

Il risultato più degno di nota è, che il latte crudo scremato e quello intero hanno una recovery ed una CV simile, dandoci la possibilità di evitare il passaggio di centrifugazione per quanto riguarda il latte vaccino

Un effetto matrice il più basso possibile

Recovery di campioni di latte





Ring Test

Test	Numero di Laboratorio	Valori Assegnati (ng/kg)	Risultati (ng/kg)	Z-score
A.I.A. Proficiency Test Lotto RT M1 270916 Aflatoxin M1 in Lyophilized Milk Settembre 2016	70	8.63	8.48	0.013
		20.27	19.31	
		33.10	32.79	
		50.25	51.66	

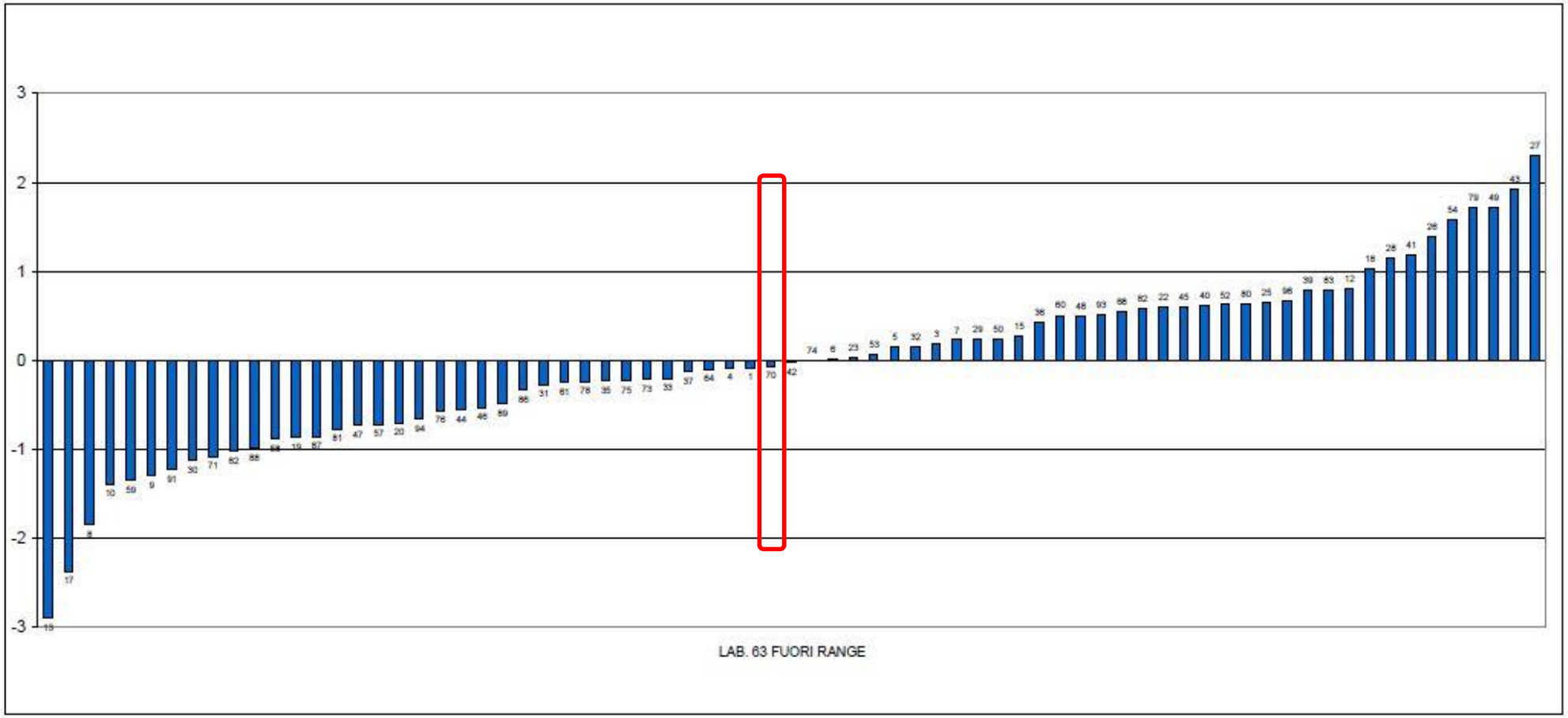
Un effetto matrice il più basso possibile

Ring Test

RING TEST
AFLATOSSINA M1
SETTEMBRE '16

Z SCORE - ELISA

Z-SCORE LABORATORI



FREQUENZE % CLASSI Z-SCORE ELISA

Un effetto matrice il più basso possibile

Ring Test

RING TEST
AFLATOSSINA M1
SETTEMBRE '16

Z SCORE - ELISA ED HPLC

Z-SCORE LABORATORI

In questo caso abbiamo ottenuto il terzo risultato migliore

LAB. 2, 34, 63, 65, 84 FUORI RANGE - LAB. 92 NON DISPONIBILE

Un effetto matrice il più ba possi

Recovery di campioni di latte in polvere

In conclusione passo a mostrarvi i valori di recovery per campioni di latte in polvere FAPAS e VERITAS

		Campioni Testati per Lotto (n)	Numero di Lotti Diversi Usati	Recovery Media	CV
FAPAS Reference Material Milk Powder TET025RM	10.30ng/kg	8	3	96.01%	4.07%
VERITAS MI1460-1/CM Progetto Trieste 2014, II round mycotoxin 2014	40.67ng/kg	8	3	102.13%	5.28%
Media				**99.07%**	

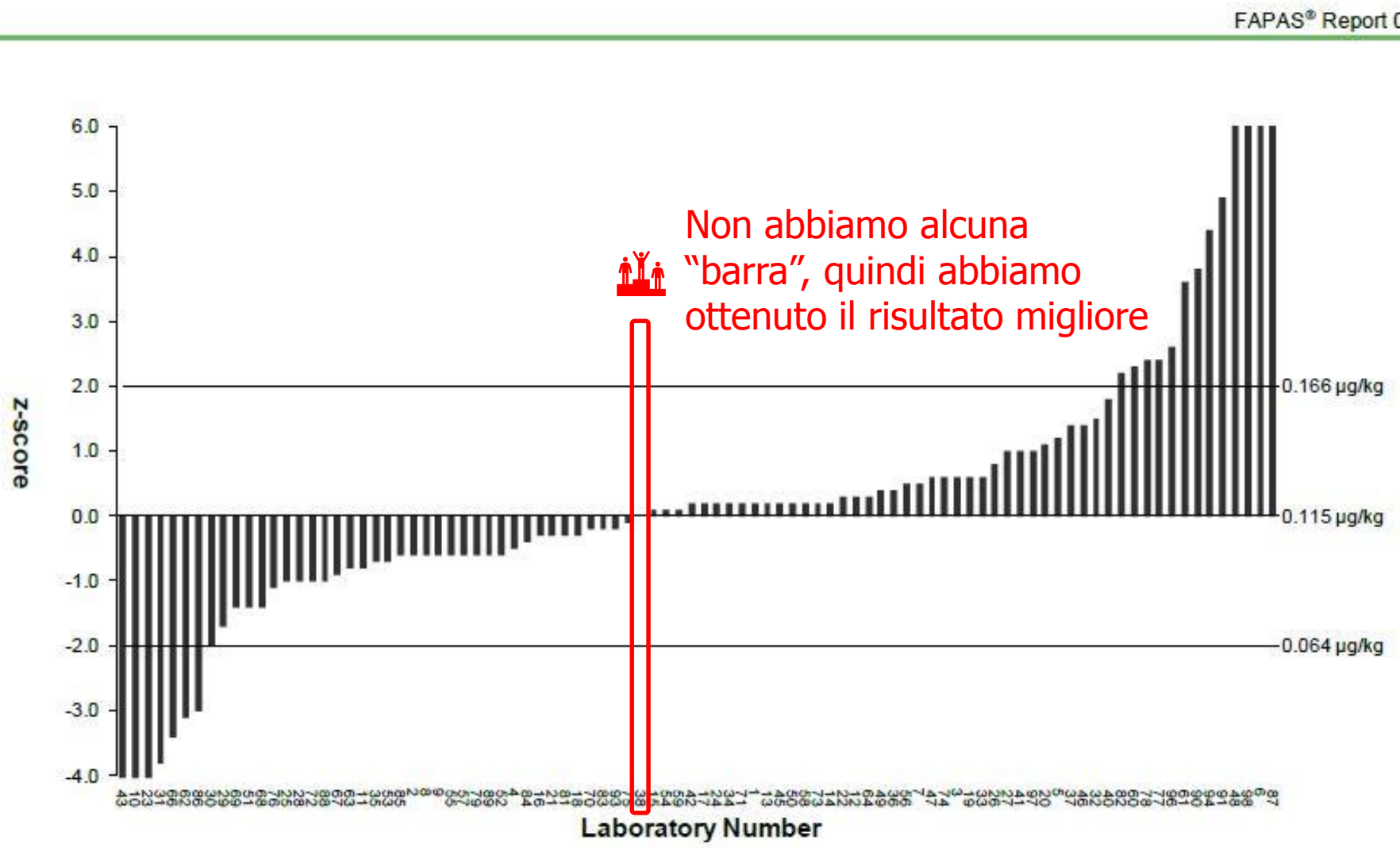
Questi risultati concordano con i risultati ottenuti nei Ring Test FAPAS

Ring Test

Test	Numero di Laboratorio	Valori Assegnati (ng/kg)	Risultati (ng/kg)	Z-score
FAPAS Proficiency Test 04217 Aflatoxin M1 in Milk Powder Mag-Giu 2013	38	115	114	0.0
FAPAS Proficiency Test 04259 Aflatoxin M1 in Milk Powder Mag-Giu 2015	23	102	93	-0.4

Un effetto matrice il più basso possibile

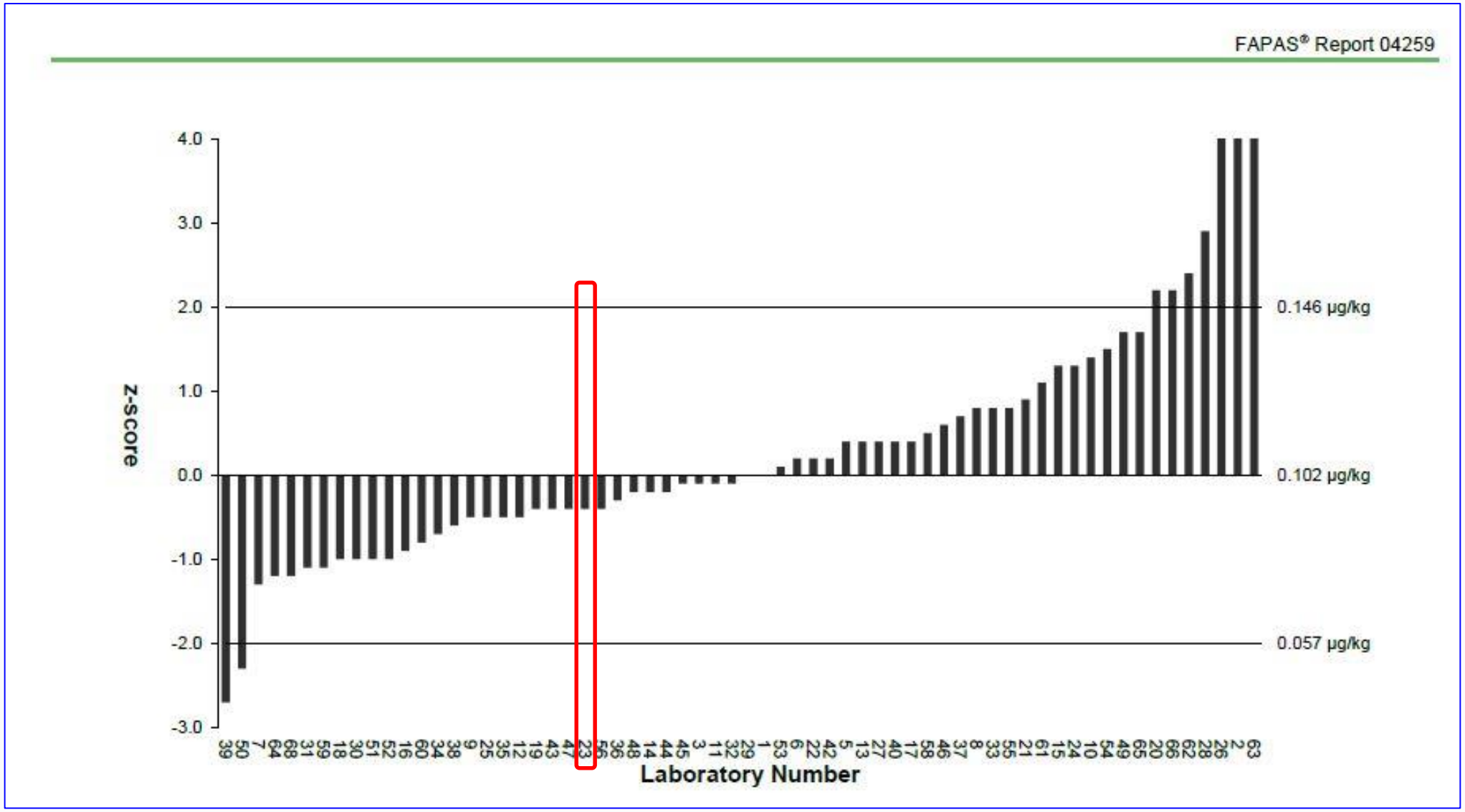
Ring Test 2013



Non abbiamo alcuna "barra", quindi abbiamo ottenuto il risultato migliore

Un effetto matrice il più basso possibile

Ring Test 2015



Grazie mille per l’attenzione

ProGnosis
BIOTECH

PRO METROFOOD
Progressing towards the construction of METROFOOD-RI
GA n. 739568

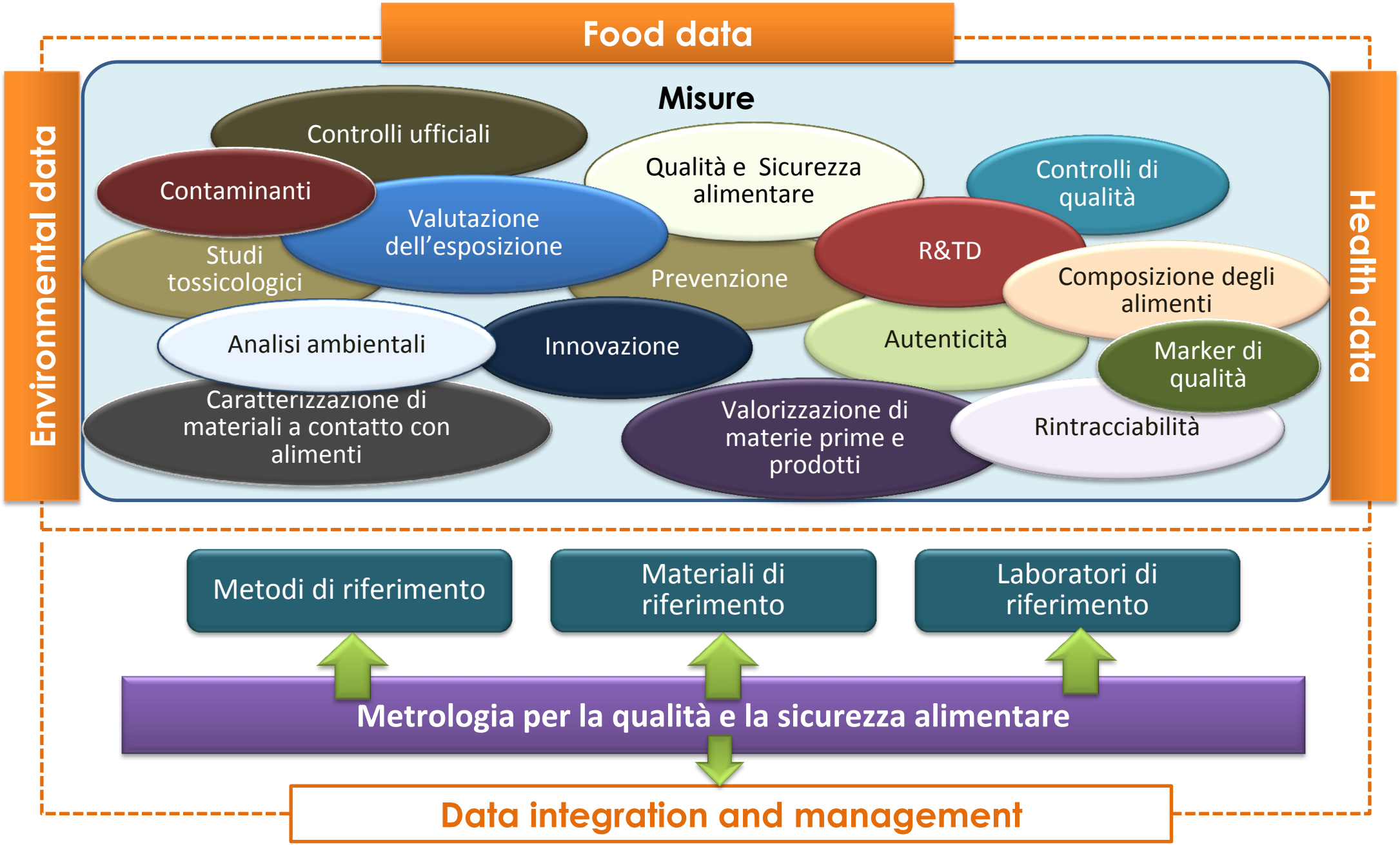
ENEA
Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile

METROFOOD
INFRASTRUCTURE FOR PROMOTING METROLOGY IN FOOD AND NUTRITION

L'INFRASTRUTTURA METROFOOD-RI

Giovanna Zappa
Coordinatore METROFOOD-RI
Responsabile scientifico del progetto Cluster Agri-food "Safe&Smart"
ENEA-SSPT-BIOAG

Metrologia per il settore agroalimentare

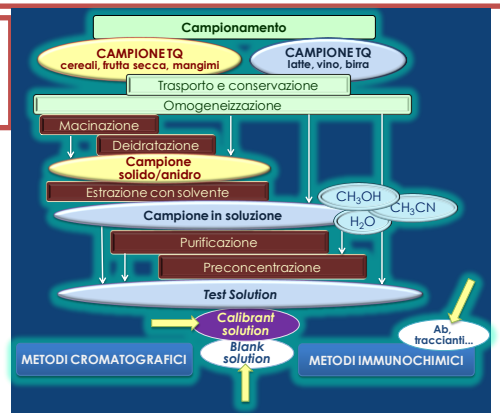


METROLOGIA A SOSTEGNO DELLA QUALITÀ, SICUREZZA, AUTENTICITÀ DELLE PRODUZIONI AGROALIMENTARI

SVILUPPO E VALIDAZIONE DI NUOVI TOOLS METROLOGICI

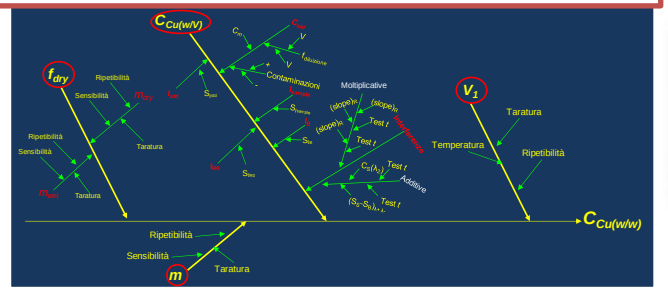
METODI DI RIFERIMENTO

PROCEDURE DI CAMPIONAMENTO



MATERIALI DI RIFERIMENTO

INCERTEZZA DI MISURA

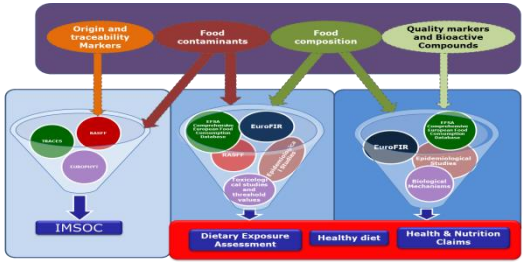


PROFICIENCY TESTINGS

STANDARDIZZAZIONE E ARMONIZZAZIONE DI MISURE & PROVE

NETWORKING CONDIVISIONE, INTEGRAZIONE E ARMONIZZAZIONE DI DATI E INFORMAZIONI

DATI



- Composizione degli alimenti
- Contaminanti alimentari
- Markers di origine & rintracciabilità
- Markers di qualità
- Composti bioattivi

La metrologia per ……

- Qualità merceologica dei prodotti
- Ottimizzazione/controllo processi
- Sicurezza alimentare
- Rintracciabilità/Autenticità
- Implementazione di nuove tecnologie

La metrologia per la QUALITÀ MERCEOLOGICA DEI PRODOTTI

Standard commerciali per i pomodori: REG. (EC) No 790/2000 of 14 Apr. 2000 s.m.i.

DEFINIZIONE DI PRODOTTO

Tipologie commerciali

round

ribbed

oblong

cherry

DISPOSIZIONI RIGUARDO LA QUALITÀ

Requisiti minimi

Classificazione | **Extra** | **Classe I** | **Classe II**

In relazione ai difetti

- Proprietà fisiche
- Proprietà microbiologiche
- Assenza di pericoli
- Lower content of harmful or un-desiderable substances
- Conservabilità e facilità d'uso
- Aspetti connessi con il packaging
- Composizione
- Presence of nutrient and nutraceuticals
- Proprietà organolettiche
- Origine delle materie prime
- Sostenibilità ambientale
- Etica delle produzioni

Valorizzazione e aumento di competitività

La metrologia per l'ottimizzazione dei processi e per favorire l'applicazione di KET nella produzione primaria

Riduzione della contaminazione degli alimenti

Aumento del valore nutrizionale/proprietà nutraceutiche

Riduzione degli input

Aumento dell'efficienza

Ottimizzazione della gestione degli scarti

Gestione degli scarti

Valorizzazione dei sotto-prodotti

La metrologia per la sicurezza alimentare

Regolamenti per la sicurezza alimentare

- Contaminanti chimici
- Contaminanti biologici
- Contaminanti radioattivi
- Additivi
- Materiali a contatto (FCM)
- OGM
- Allergeni
- Nano-ingredienti
- Farmaci veterinari e prodotti fitosanitari

Misure & Prove

Identificazione delle fonti

Ottimizzazione dei processi

Ispezioni e controlli

Produzione di alimenti con livelli di contaminanti, antinutrizionali e sostanze indesiderabili bassi/molto bassi

Aumento della fiducia dei consumatori nella sicurezza alimentare e nel sistema dei controlli

METROLOGIA

Valore aggiunto alle produzioni

Prodotti per specifici gruppi di consumatori

Accesso a nuovi mercati

Competitività

Alimenti "più sicuri"

Produzione alimentare

Ispezioni e Controlli

Fiducia dei Consumatori

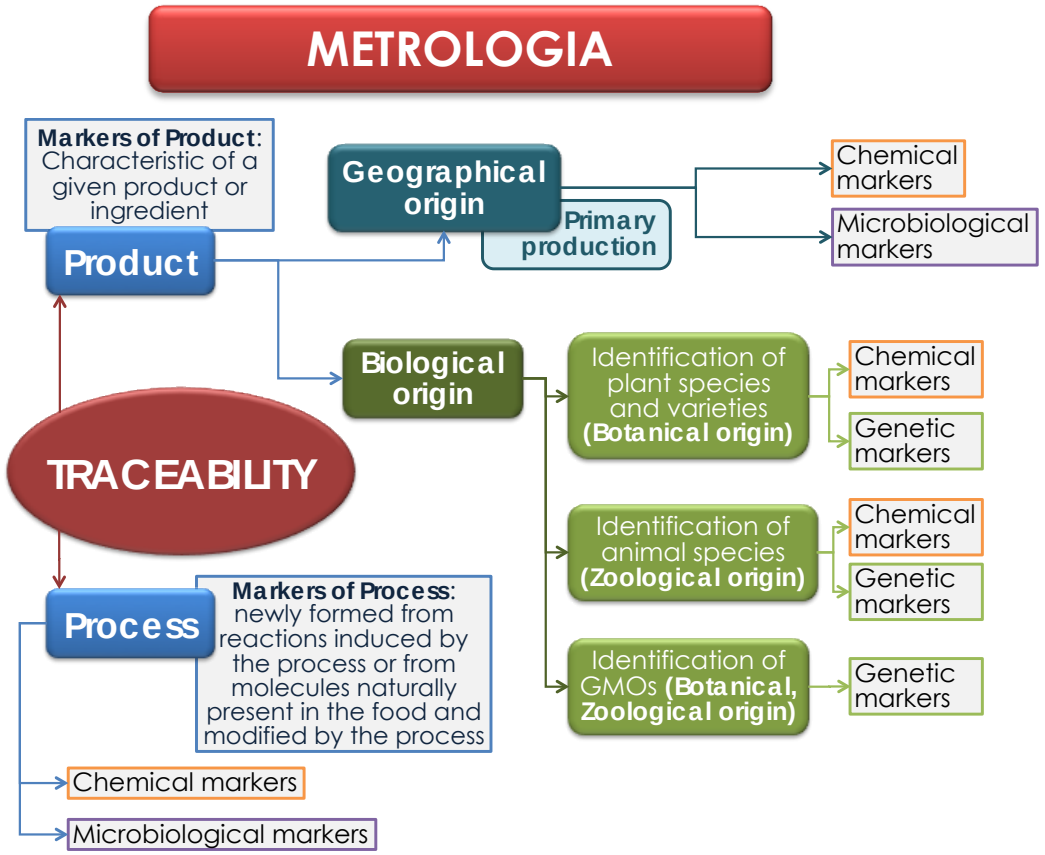
Scelte dei consumatori

METROLOGIA per la TRACCIABILITÀ E L'AUTENTICITÀ

"Traceability" - Reg. (EC) 178/2002
"the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution"

"one step back – one step forward"

FBOs must have in place a system enabling them to identify their immediate supplier(s) and their immediate customer(s), except when they are final consumers



Product withdrawal/recall

Labelling

Paper Trail

Bar-coding

RFID

Authenticity

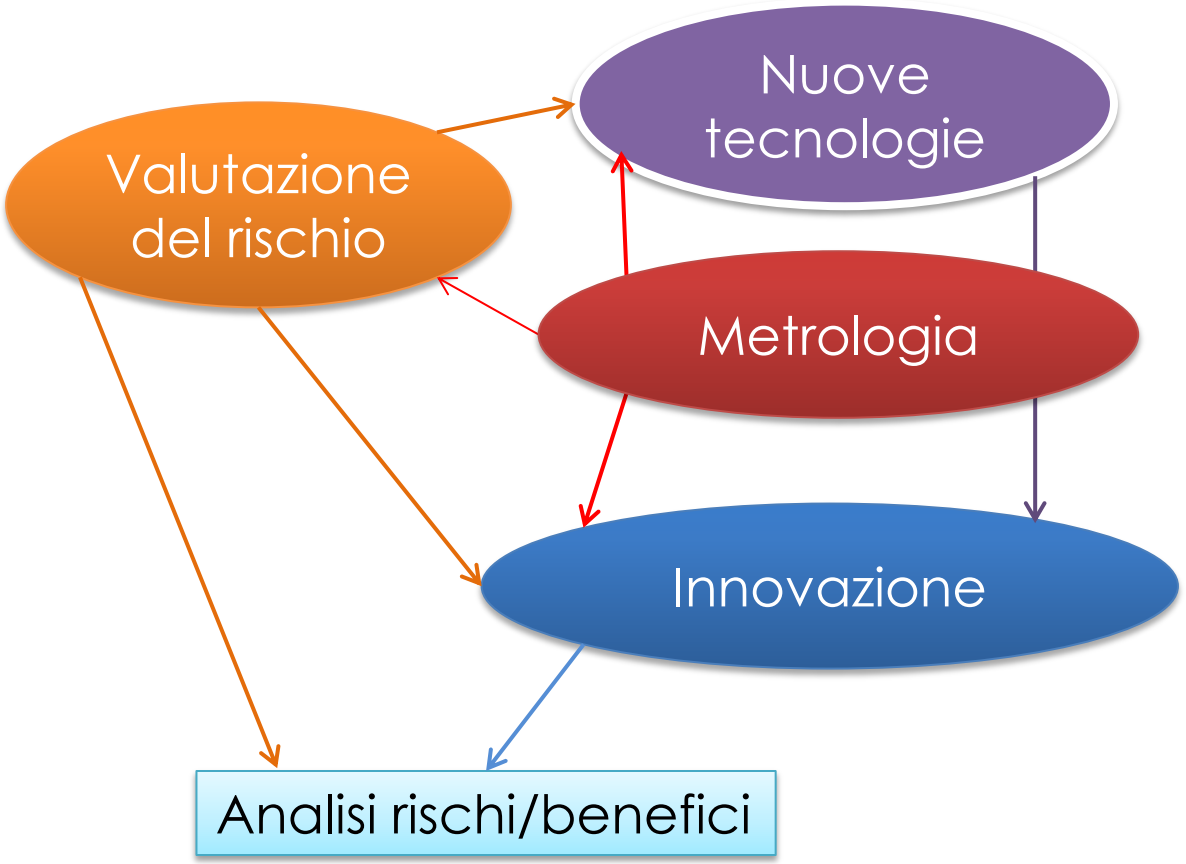
Control of origin and production practices

Detection of frauds

Authenticity testing of foods

Global data synchronisation

La METROLOGIA per l'innovazione e per consentire l'introduzione di nuove tecnologie



NANOTECNOLOGIE ⟷ NANOMETROLOGIA ⟷ NANOTOSSICOLOGIA

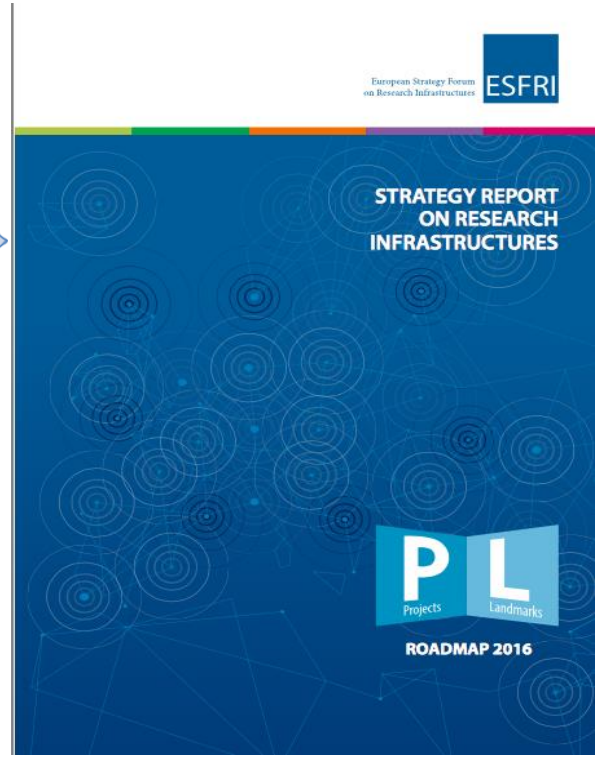
METROFOOD-RI

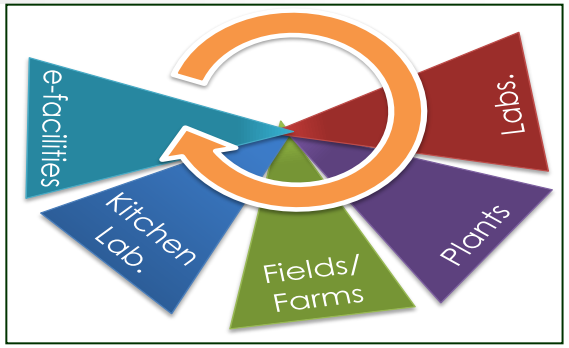
Obiettivo generale:
migliorare l'eccellenza scientifica nel campo della qualità e sicurezza alimentare promuovendo la metrologia per alimenti e nutrizione, consentendo un coordinamento su scala europea ed aprendo scenari anche su scala globale.

- Migliorare qualità e affidabilità delle misure
- Rendere disponibili e condividere dati, informazioni e *tools* metrologici
- Accrescere l'eccellenza scientifica nel campo della qualità e sicurezza alimentare
- Rafforzare le conoscenze scientifiche, promuovere la cooperazione e l'integrazione

Research Infrastructures

2016 ESFRI Roadmap
Domain Health & Food
"Emerging Project"





METROFOOD

INFRASTRUCTURE FOR PROMOTING METROLOGY IN FOOD AND NUTRITION

Physical-RI

- **Metro**
  - Plants and Labs for RM development
    - RM Preparation
    - Stability and homogenity studies
  - Analytical Labs.
    - Sampling, pretreatment and storage
    - Food composition and characterization
    - Inorganic contaminants
    - Organic contaminants
    - Chemical and biological markers and profiles
    - Microbiological analysis
    - Development of sensors and devices
    - Environmental Analysis
    - Testing (rheological, leaching, etc.)
    - Other
- **Food**
  - Experimental fields/farms
    - Crop production
    - Animal breedings
    - Fish farms
  - Facilities for food processing and storage
    - Industrial processing
    - Packaging
    - Supply chain and storage
    - Food preparation

e-RI

- Software development
  - development of new databases
  - Integration of existing databases
  - graphical interfaces development
  - database manteinance and updating
- Data collection
- Data analysis
- Management of Interlaboratory tests
- Diffusion and Training

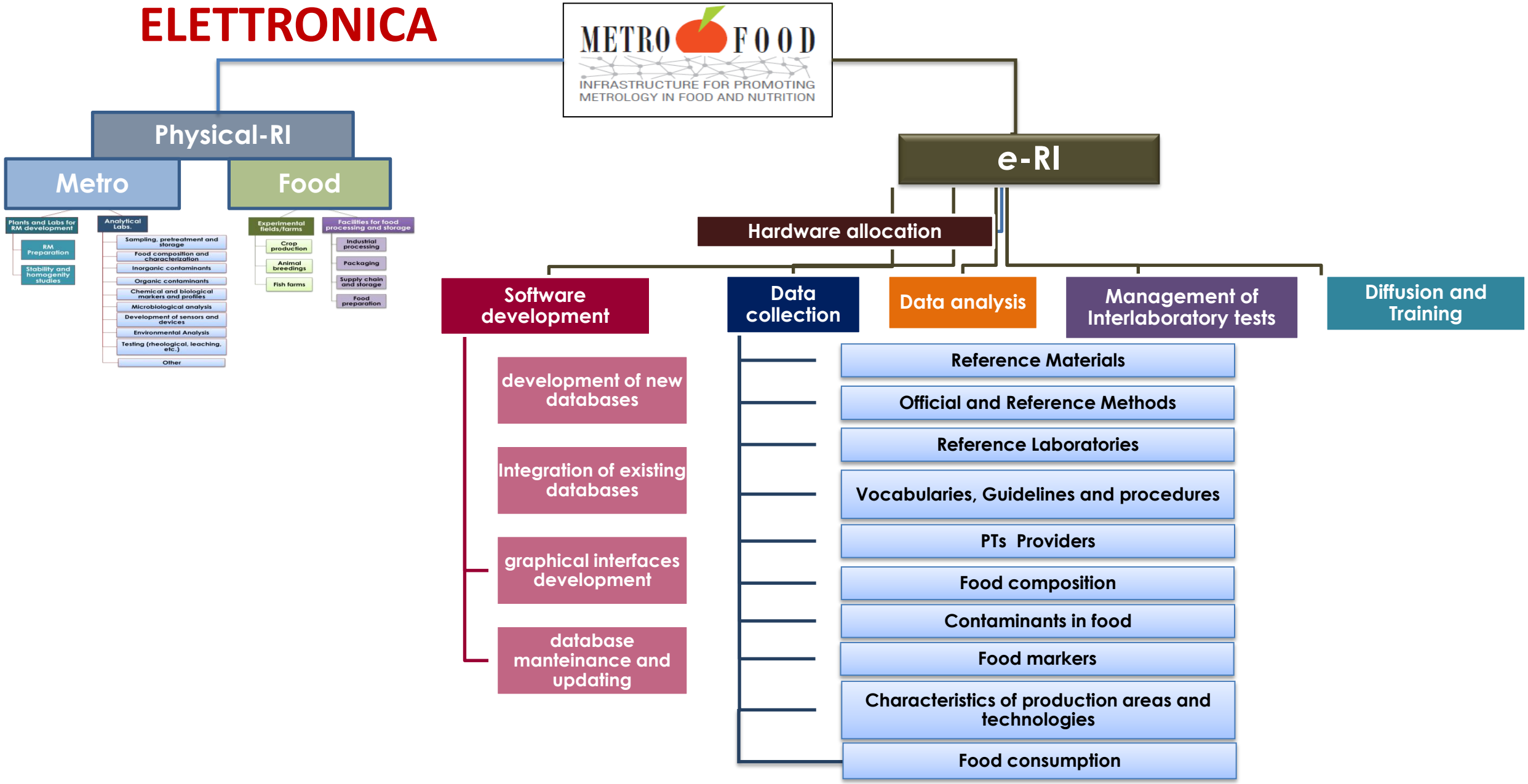
Data collection:
- Reference Materials
- Official and Reference Methods
- Reference Laboratories
- Vocabularies, Guidelines and procedures
- PTs Providers
- Food composition
- Contaminants in food
- Food markers
- Characteristics of production areas and technologies
- Food consumption

INFRASTRUTTURA FISICA

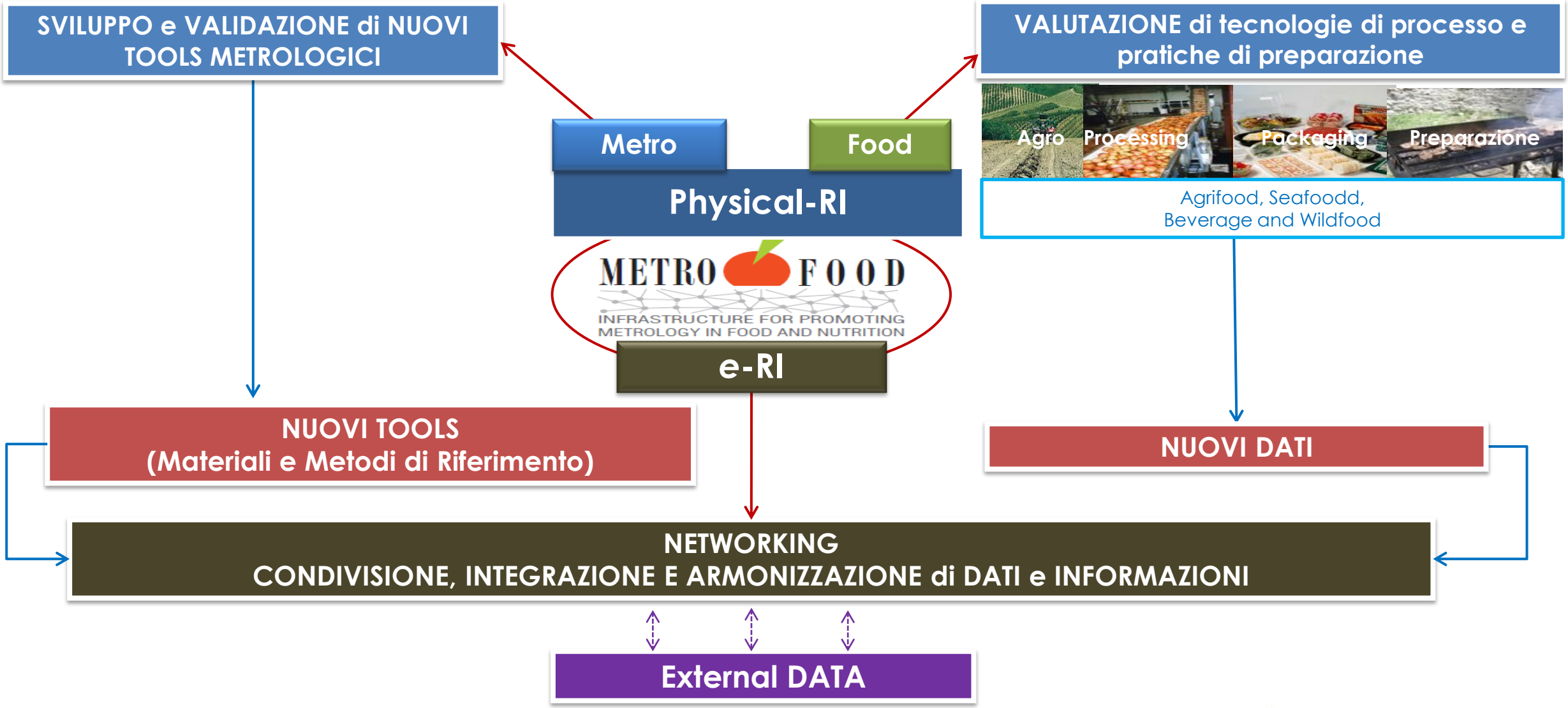
METRO FOOD
INFRASTRUCTURE FOR PROMOTING METROLOGY IN FOOD AND NUTRITION

- Physical-RI
  - Metro
    - Plants and Labs for RM development
      - RM Preparation
      - Stability and homogeneity studies
    - Analytical Labs.
      - Sampling, pretreatment and storage
      - Food composition and characterization
      - Inorganic contaminants
      - Organic contaminants
      - Chemical and biological markers and profiles
      - Microbiological analysis
      - Development of sensors and devices
      - Environmental Analysis
      - Testing (rheological, leaching, etc.)
      - Other
  - Food
    - Experimental fields/farms
      - Crop production
      - Animal breeding
      - Fish farms
    - Facilities for food processing and storage
      - Industrial processing
      - Packaging
      - Supply chain and storage
      - Food preparation
- e-RI

INFRASTRUTTURA ELETTRONICA



Collegamenti tra l'infrastruttura fisica e quella elettronica



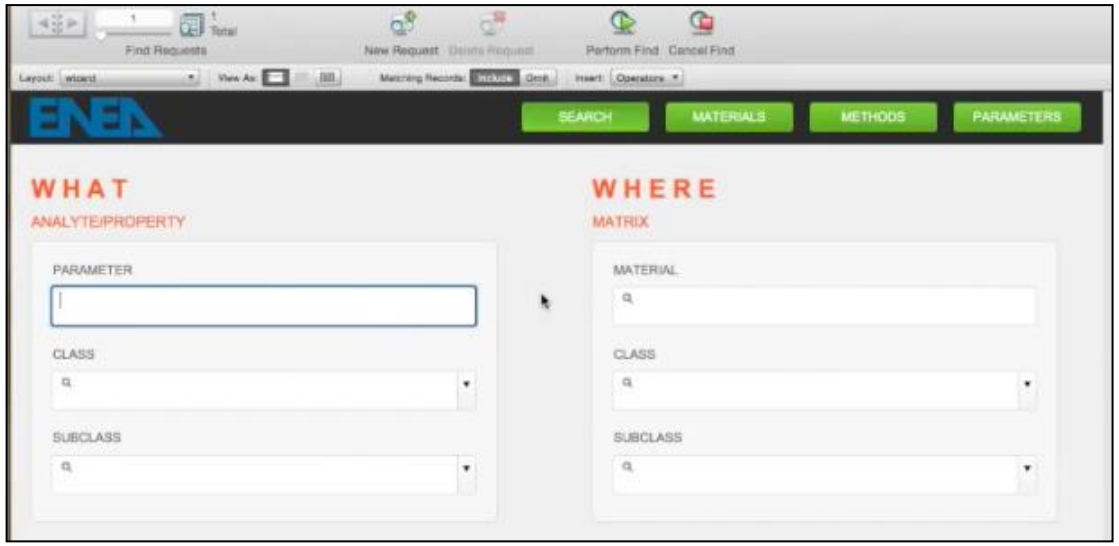
Integrazione di dati: esempio (1)

web services

Nel settore Agri-food attualmente le informazioni relative ai metodi, materiali di riferimento, laboratori di riferimento, valori soglia sono disperse su più siti:

COMAR · ISO · AOAC INTERNATIONAL · cen · European Commission · eptis

Findable **A**ccessible **I**nteroperable **R**eusable



Obiettivo: fornire ai laboratori un servizio innovativo e unico, che consenta loro di ottenere – a partire da una specifica esigenza analitica - tutte le necessarie informazioni in termini di:

- performances dei metodi da applicare
- materiali di riferimento disponibili per valutare accuratezza e incertezza dei risultati
- limiti normativi o altri valori soglia
- circuiti di confronto interlaboratorio

Materiali di riferimento

Circuiti interlaboratorio

Metodi ufficiali di analisi

Valori soglia

Integrazione di dati: esempio (2)

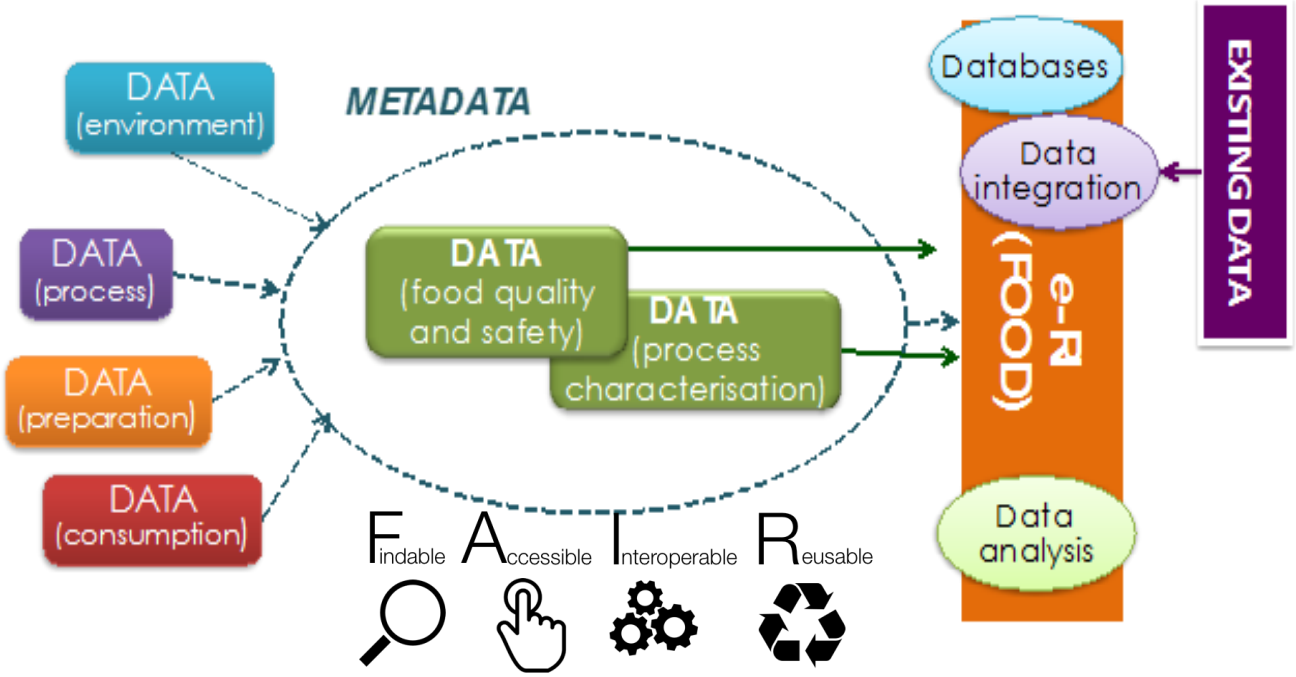
Le informazioni relative alla composizione degli alimenti, ai materiali a contatto, ai suoli sono disperse su più siti e più database nazionali e internazionali:

EuroFIR European Food Information Resource

crea Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria

Cncp Centro Nazionale Cartografia Pedologica

Food Contact Materials



Obiettivo: rendere fruibili ai diversi utilizzatori una serie di dati organizzati e fornire servizi innovativi d'integrazione e analisi dei dati per diverse finalità:

- sviluppo di *best practices* per tutte le fasi (dalla produzione primaria fino alla preparazione e conservazione domestica);
- definizione di attitudini (vocazionalità) territoriali e ambientali;
- innovazione di prodotti e processi;
- sostenibilità e valorizzazione delle produzioni;
- analisi di rischio;
- definizione di strategie di prevenzione e controllo;
- sviluppo di sistemi per garantire l'autenticità dei prodotti;
- sviluppo di *smart solution* per supportare i consumatori nelle scelte alimentari e nelle procedure domestiche.

METROFOOD-RI: Partnership attuale

Istituti di Ricerca

- ENEA, CNR, CREA, FEM (IT)
- CIDETEC (ES)
- IBA (RO)
- TUBITAK (TR)
- ISPHTA (MD)
- Stichting WR (NL)
- JSI(SI)
- NIB(SI)

Università

- Udine, Brescia, Fed.II Napoli (IT)
- AUTH (GR)
- CULS (CZ)
- Pau (FR)
- SZU (HU)
- TUM (DE)
- Primorska (SI)
- Skopje (MK)

Istituti per la Sicurezza Alimentare e la Protezione della Salute

- ISS, IZS, IEO (IT)
- INSA (PT)
- ANSES (FR)
- PHI (MK)
- EVIRA (FI)
- WIV-ISP (BE)
- RIVM (NL)

Istituti Metrologici Nazionali

- LNE (FR)
- INRIM (IT)

Organizzazioni Internazionali

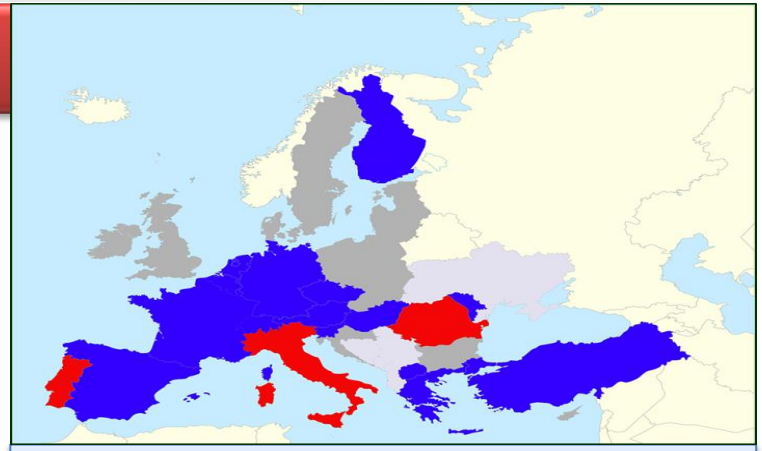
- FAO

Laboratori per l'Analisi degli Alimenti

- UT2A (FR)

Aziende Private

- Premotech GmbH (SW)



36 Partners da 17 Paesi
+ 1 Partner Internazionale (FAO)

JOINT RESEARCH UNITS già stabilite

METROFOOD-IT
ENEA*, CNR, CREA, ISS, INRIM, FEM, Udine Un., Brescia Un., Napoli FedII Un., IEO

METROFOOD-SL
JSI*, NBI, Primoska Un.

METROFOOD-MK
IJZRM*, Skopje Un.

* JRU Coordinator

MoU

French Partners
UPPA, LNE, ANSES, UT2A

Joint Research Unit METROFOOD-IT

METROFOOD-IT

JOINT RESEARCH UNIT METROFOOD-IT

Comitato di Coordinamento

ENEA – Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile

Consiglio Nazionale delle Ricerche

crea – Consiglio per la ricerca in agricoltura e l'economia agraria

IEO – Istituto Europeo di Oncologia

INRiM

Innovation Responsible Research society

FONDAZIONE

Condivisione di strategie progettuali

Integrazione e messa a sistema di risorse, competenze e capacità

Promuovere innovazione di prodotto e di processo

Allineare la ricerca e l'innovazione ai valori, ai bisogni e alle aspettative della Società.

Avvicinare la Scienza ai cittadini

Migliorare efficienza ed efficacia del sistema dei controlli

Min. RICERCA | Min. SALUTE | Min. AGRICOLTURA | Min. ECONOMIA | Min. ESTERI

Endorsements da Organizzazioni Internazionali

International Measurement Confederation

EU JRC-Institute for Reference Materials and Measurements

Food and Agriculture Organization of the United Nations

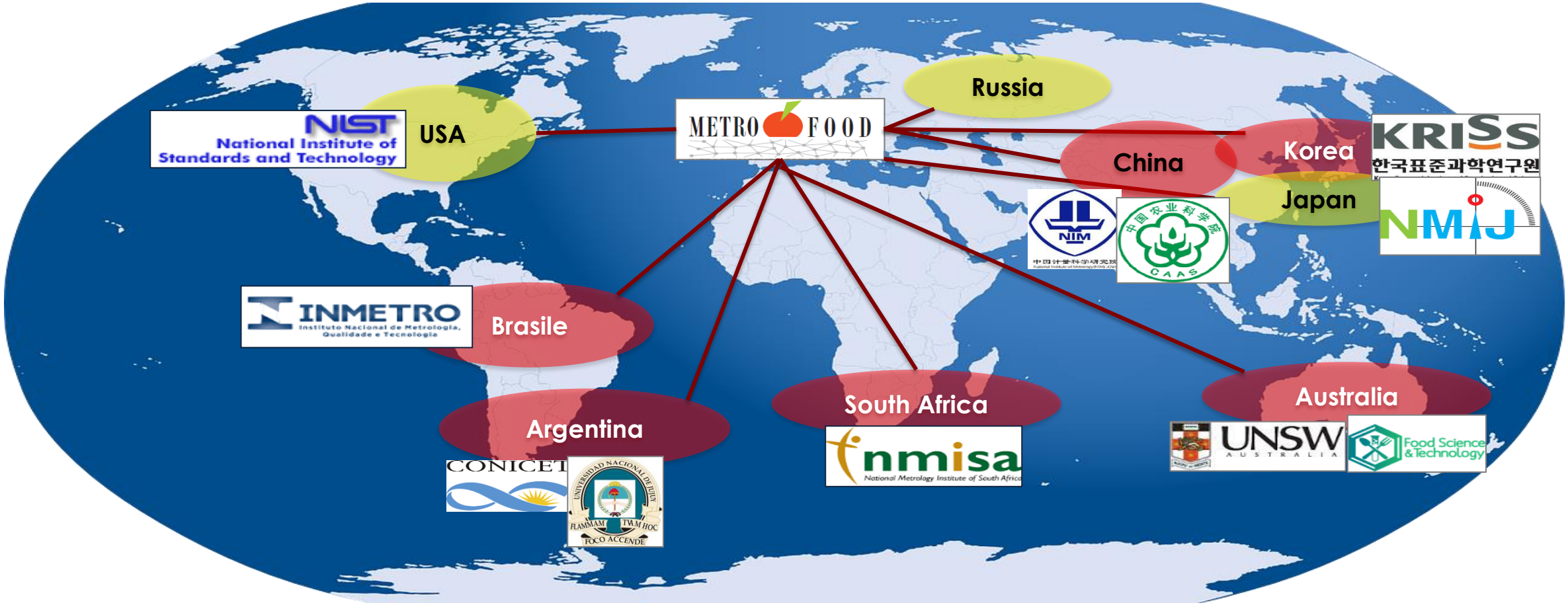
SPread European Safety

12 Federations of Food&Beverage Industries

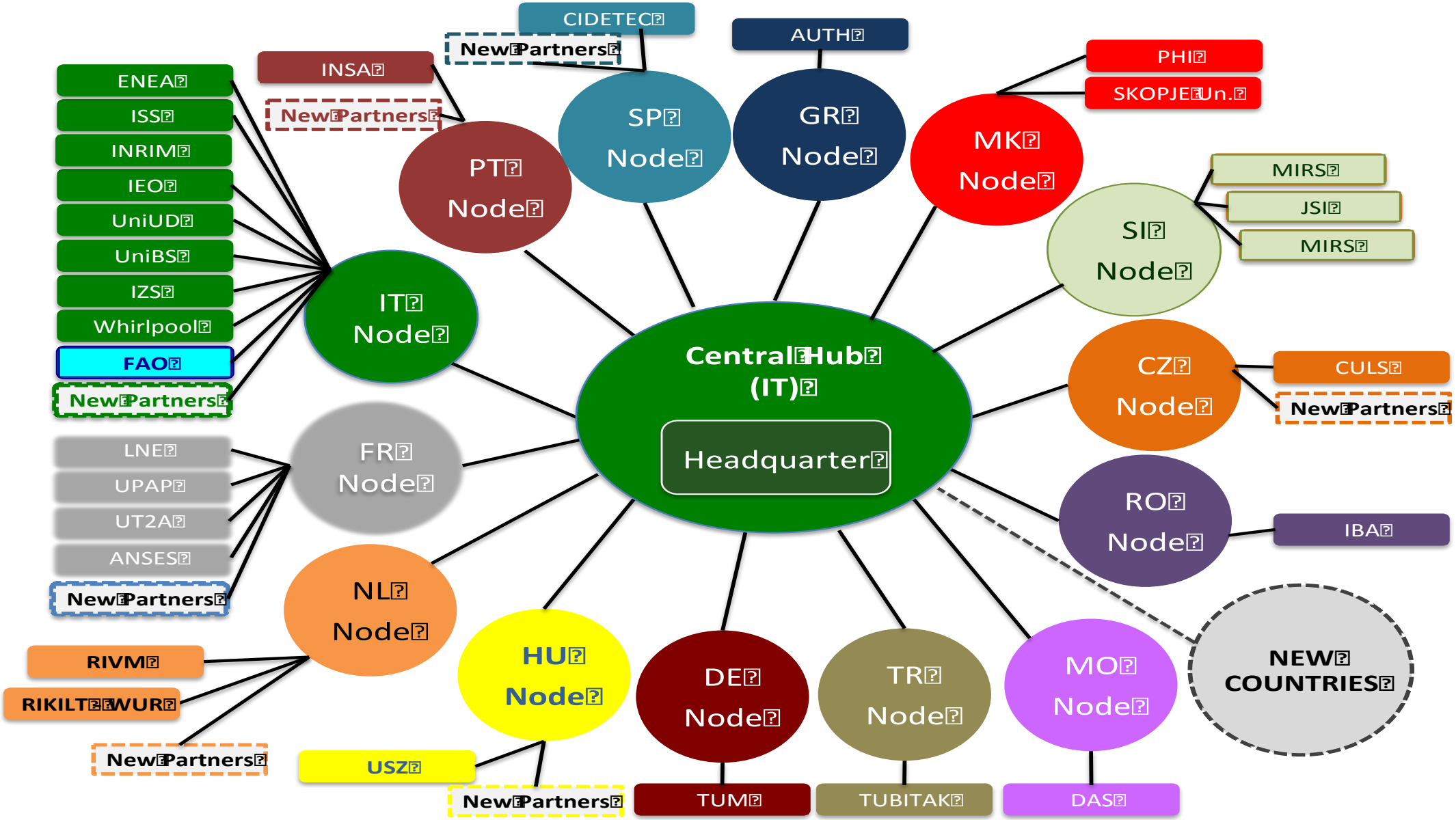
European Union Reference Laboratory for Chemical Elements in Food of Animal Origin

Versailles Project on Advanced Materials and Standards

METROFOOD-RI: Livello Globale



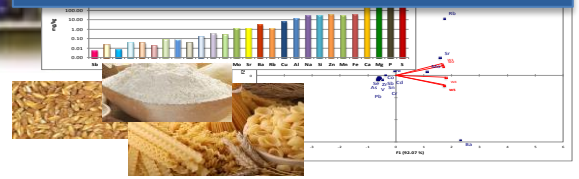
METROFOOD-RI: modello *Hub & Nodi*



SERVIZI di METROFOOD-RI

NUOVI TOOLS PER LA RIFERIBILITÀ DELLE MISURE

DEFINIZIONE E IDENTIFICAZIONE DI MARKERS



EDUCATION & TRAINING

METRO FOOD

INFRASTRUCTURE FOR PROMOTING METROLOGY IN FOOD AND NUTRITION

CONDIVISIONE DI INFORMAZIONI & COMUNICAZIONE

DEFINIZIONE DI BEST PRACTICES

CONDIVISIONE & INTEGRAZIONE DATI

Findable Accessible Interoperable Reusable

web services

METROFOOD-RI: POTENZIALI UTENTI

FOOD BUSINESS OPERATORS

POLICY MAKERS / FOOD INSPECTIONS & CONTROL

METRO FOOD

INFRASTRUCTURE FOR PROMOTING METROLOGY IN FOOD AND NUTRITION

RICERCA/UNIVERSITÀ

CONSUMATORI/CITTADINI

Benefici/impatti di METROFOOD-RI

FBOs

- Rafforzare l'internazionalizzazione, l'export e i mercati
- Costruire la competitività su basi oggettive
- Portare valore aggiunto

Consumatori

- Rafforzare la fiducia dei consumatori
- Fornire informazioni e conoscenze per consentire scelte consapevoli e affidabili

Comunità Scientifica

- Sviluppo di competenze e capacità
- Implementazione di nuove tecnologie
- Analisi rischi/benefici
- Definizione di best practices
- Promozione dell'integrazione delle conoscenze

Società

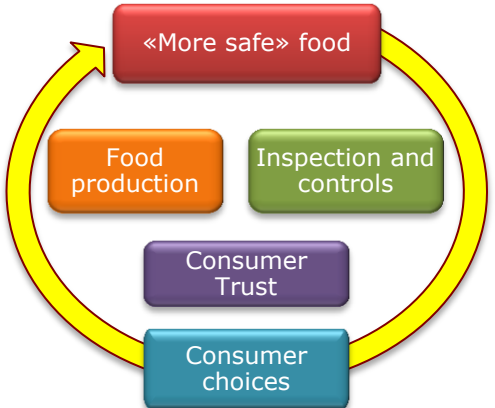
- Permettere controlli alimentari più efficienti
- Migliorare la sicurezza e la salubrità delle produzioni
- Supportare le politiche ambientali e lo sviluppo sostenibile

Prevenire le crisi alimentari

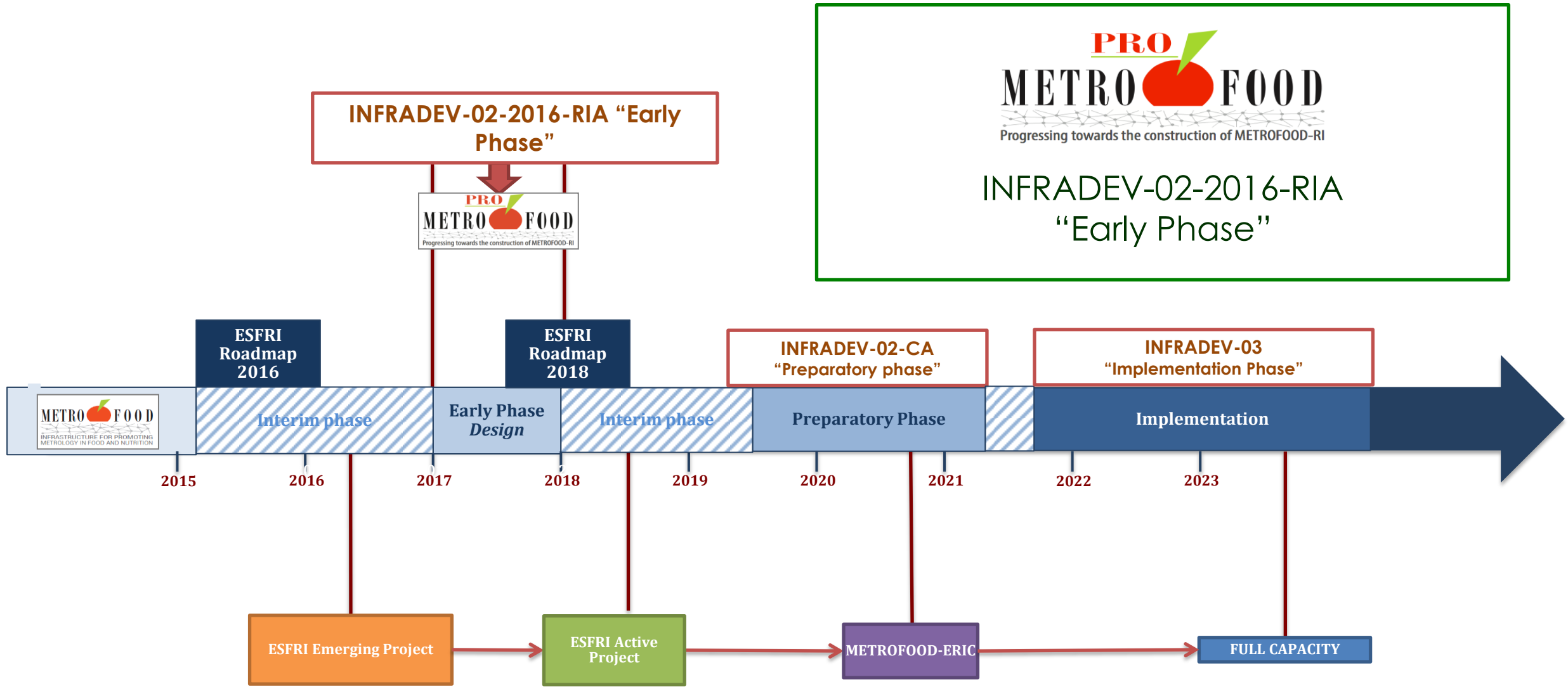
Stabilire un circolo virtuoso di domanda e offerta di alimenti sempre più sani e sostenibili

Impatto positivo sulla salute dei cittadini

Impatto positivo sui mercati Europei



METROFOOD-RI timeline



Grazie per l'attenzione!

Contatti

METROFOOD
INFRASTRUCTURE FOR PROMOTING METROLOGY IN FOOD AND NUTRITION

www.metrofood.eu

Coordinatore

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info@metrofood.eu - claudia.zoani@enea.it

Tel: +39 06 3048 6202

ENEA – C.R. Casaccia, Via Anguillarese 301

00123 Roma (Italy)

THE GLOBAL STANDARD
FOR LIVESTOCK DATA

Network. Guidelines. Certification.

ICAR's proficiency testing scheme (PT) e Certificazioni ICAR per strumenti di analisi Latte !

Silvia Orlandini & Cesare Mosconi

Version 1.0

21-3-2017 Roma, 23 Marzo 2017

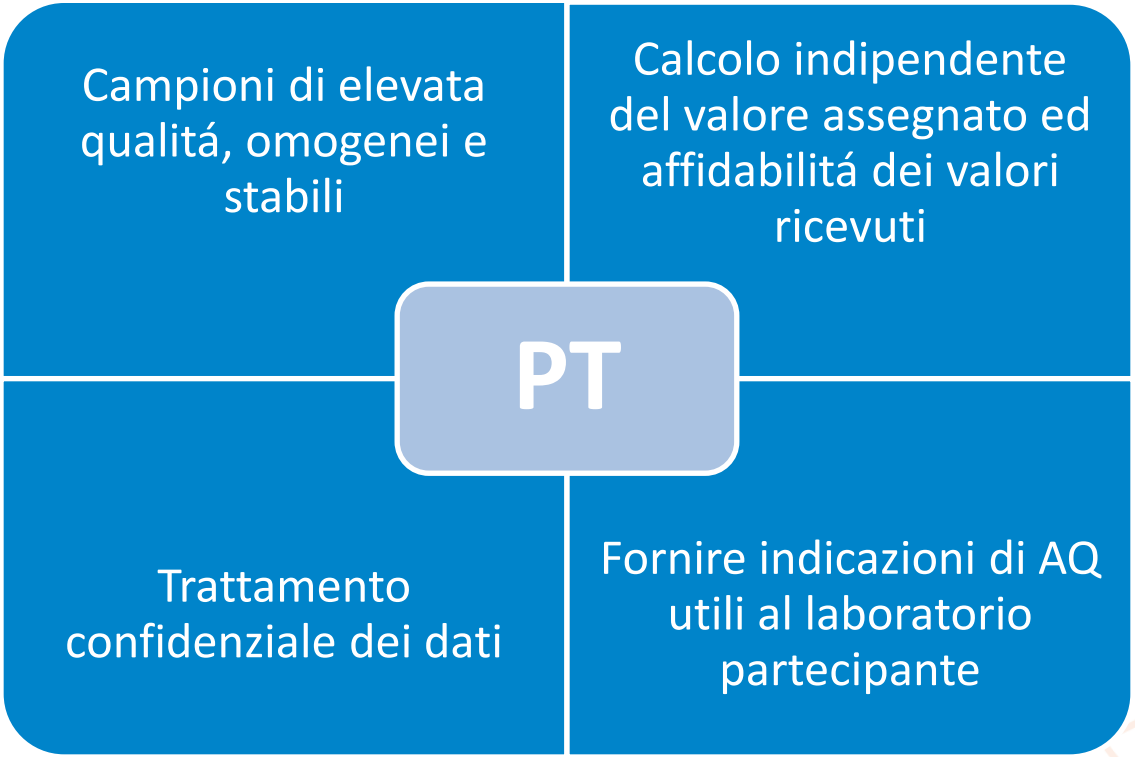
Contenuto

- ICAR PT
- Confronto di „popolazioni analiiche“
- Certificazione ICAR

Che cosa é un proficiency testing.....

Proficiency testing (PT)

Viene definito come strumento per valutare la performance del laboratorio partecipante che si confronta con dei criteri prestabiliti e con la popolazione dei partecipanti.



Se eseguito nel contesto di un programma di Assicurazione qualitá, un PT ISO 17043 é uno strumento indipendente per assicurare la qualitá dei risultati e delle tarature come descritto in ISO/IEC 17025

Che cosa é un ICAR PT.....

- ICAR PT fornisce uno schema progettato per faciliatare il miglioramento della qualitá delle analisi dei controllil funzionali.
- La partecipazione fa si che si possano ricevere informazioni sulla performance dei metodi nella popolazione internazionale ICAR
- Il report INDIVIDUALE sintetico facilitá l´immediata rappresentazione della performance del laboratorio
- Attraverso il PT ICAR é possibile raccogliere informazioni sulle procedure di AQ nei laboratori che eseguono i controlli funzionali e ció faciliterá la rappresentazione della precisione della popolazione ICAR (e.g tipo di MRs utilizzati, versione del modello di calibrazione, standardizzazione dello spettro)

Parametri offerti

Metodi Chimici

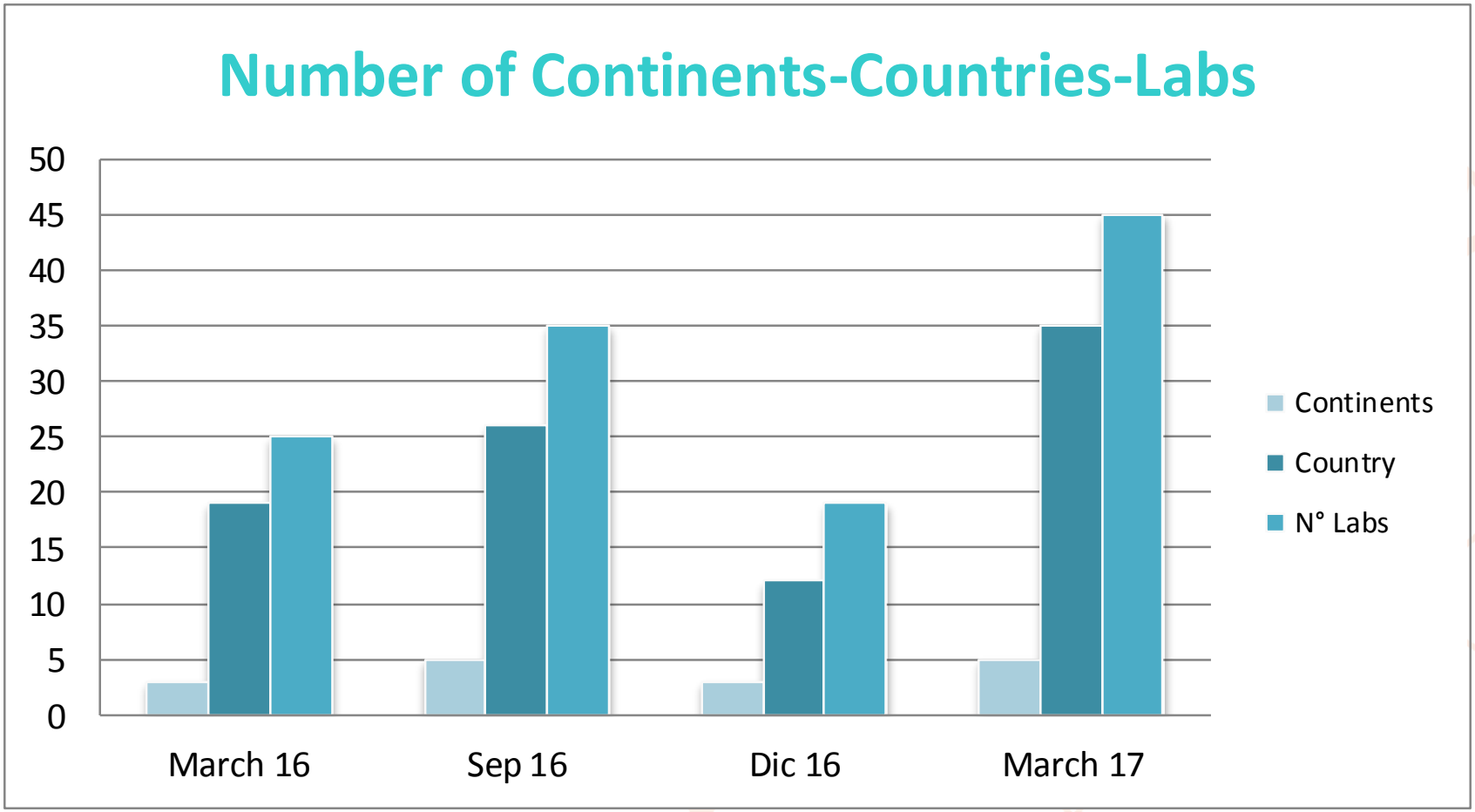
- Grasso
- Proteine
- Lattosio
- Urea
- Cellule Somatiche (Microscopio+Routine)

Metodi di Routine

- Grasso
- Proteine
- Lattosio
- Urea
- BHB (Beta-Hydroxybutyrate)
- Bacterial DNA (PCR)
- PAG (pregnancy-associated glycoproteins)

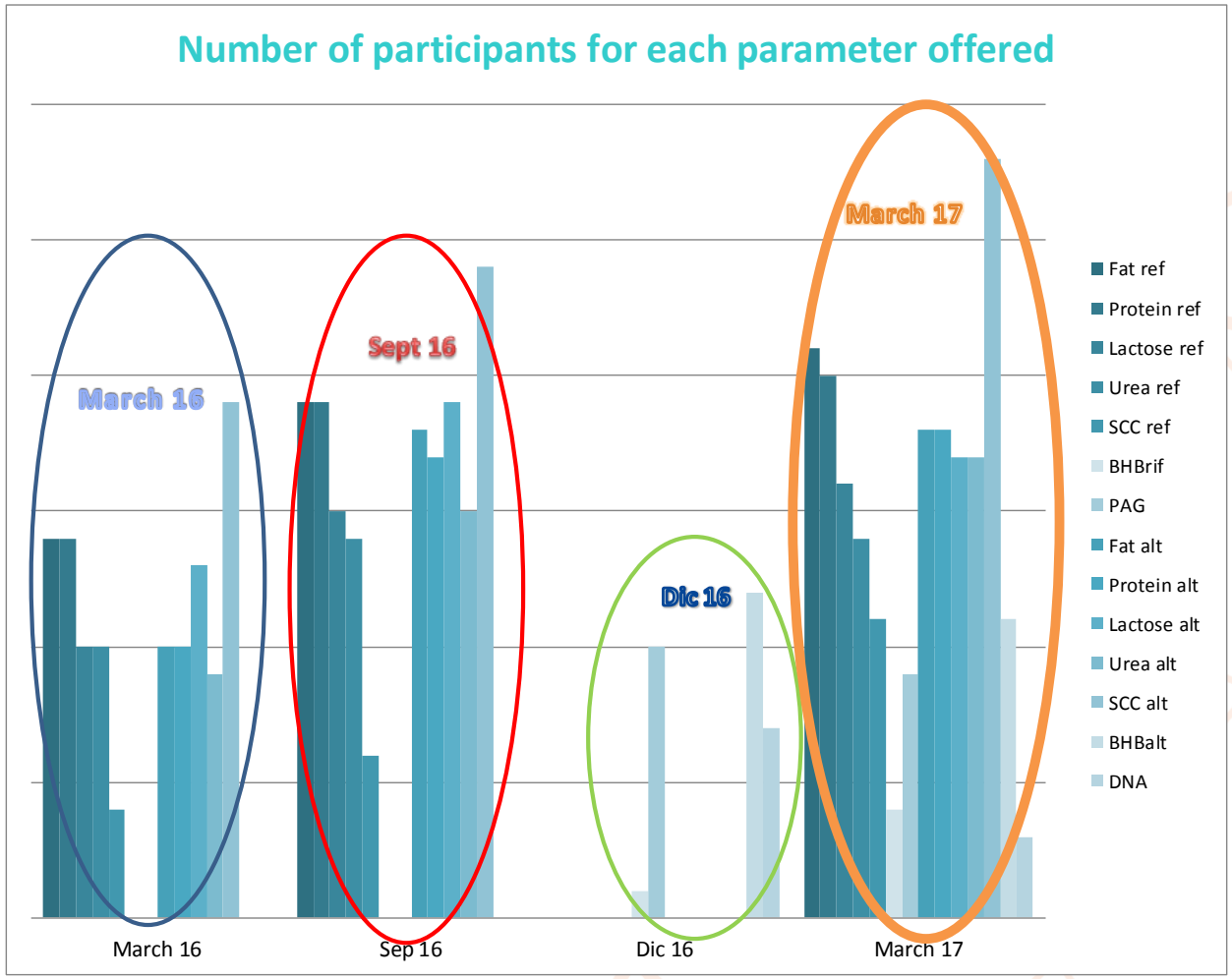
Evoluzione del PT ICAR nel 2016-2017

Totale 45 Participanti – 35 Paesi- 5 Continenti



Evoluzione del PT ICAR nel 2016-2017

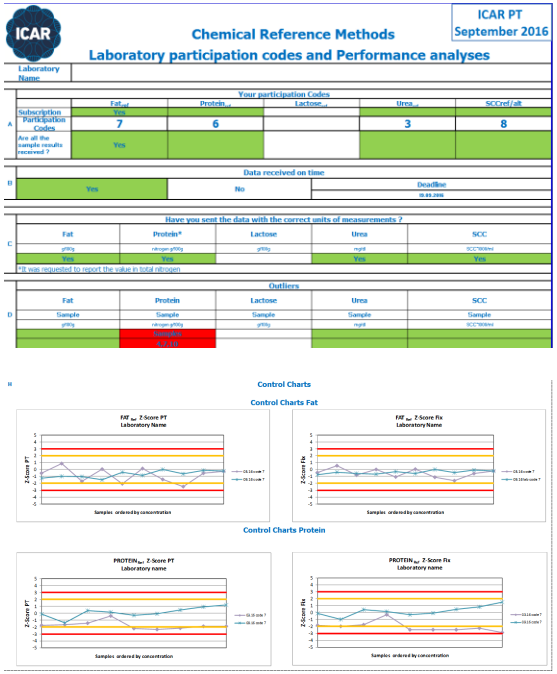
Totale 45 Participanti – 34 Paesi- 5 Continenti



ICAR PT Reports

Valutazione per il partecipante

- Performance Individuale


ICAR PT September 2016

Chemical Reference Methods

Laboratory participation codes and Performance analyses

Laboratory Name

Your participation Codes

	Fat$_{ref}$	Protein$_{ref}$	Lactose$_{ref}$	Urea$_{ref}$	SCCref/alt
Subscription	Yes				
A Participation Codes	7	6		3	8
Are all the sample results received ?	Yes				

Data received on time

B	Yes	No	Deadline 05.09.2016

Have you sent the data with the correct units of measurements ?

	Fat	Protein*	Lactose	Urea	SCC
C	g/100g	nitrogen g/100g	g/100g	mg/dl	SCC*1000ml
	Yes	Yes		Yes	Yes

*It was requested to report the value in total nitrogen

Outliers

	Fat	Protein	Lactose	Urea	SCC
D	Sample	Sample	Sample	Sample	Sample
	g/100g	nitrogen g/100g	g/100g	mg/dl	SCC*1000ml
		Samples 1,2,3,4,5			

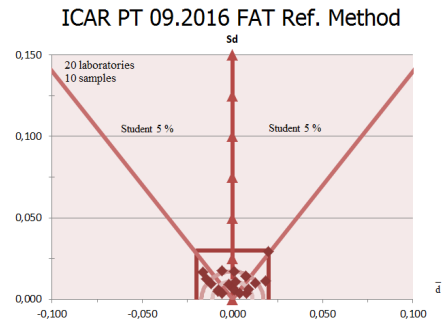
Control Charts

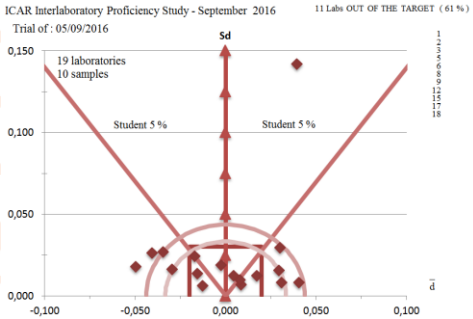
Control Charts Fat

Control Charts Protein

Valutazione per ICAR

- Performance Globale





Partecipante ICAR PT Reports (1)

ICAR PT
September 2016

Chemical Reference Methods
Laboratory participation codes and Performance analyses

Lab Name

Laboratory Name	

P. codes

	Your participation Codes				
	Fat_{ref}	$Protein_{ref}$	$Lactose_{ref}$	$Urea_{ref}$	SCCreffalt
Subscription	Yes				
Participation Codes	7	6		3	8
Are all the sample results received ?	Yes	Yes		Yes	Yes

Time

B	Data received on time		
	Yes	No	Deadline
			19.09.2016

Units

C	Have you sent the data with the correct units of measurements ?				
	Fat	Protein*	Lactose	Urea	SCC
	g/100g	nitrogen g/100g	g/100g	mg/dl	SCC*1000/ml
	Yes	Yes		Yes	Yes

*It was requested to report the value in total nitrogen

Outliers

D	Outliers				
	Fat	Protein	Lactose	Urea	SCC
	Sample	Sample	Sample	Sample	Sample
	g/100g	nitrogen g/100g	g/100g	mg/dl	SCC*1000/ml
		Samples			
		4,7,10			

Participante ICAR PT Reports (2)

Repeatability

Z-Score

Ranking

E

Repeatability										
Your "r" performance					Limits					
Fat	Protein	Lactose	Urea	SCC	Fat	Protein	Lactose	Urea	SCC	
g/100g	nitrogen g/100g	g/100g	mg/dl	SCC*1000/ml	g/100g	g/100g	g/100g	mg/dl	SCC*1000/ml	
					ISO 1211 IDF 1D	ISO 8368 IDF 20	ISO 22662 IDF 198	ISO 14637 IDF 195	ISO 13366-2 IDF 148-2	
									Level	r
					0,043	0,038	0,06	1,52	150	25
									300	42
									450	51
									750	64
									1500	126

If the repeatability is smaller than the limit the cell is in green if there is a sample with a "r" bigger than the limit the cell is in red. Please check table II in correspondence of the parameter and your lab code.

F

Z-Score										
Your Z-Score PT					Interpretation Z-Score					
Fat	Protein	Lactose	Urea	SCC	-2<Z-Score<2	-3<Z-Score<-2	2<Z-Score<3	Z-Score<-3	Z-Score>3
	Samples 7,1				Good	Moderate	Moderate	Poor	Poor
Your FIX Z-Score									
Fat	Protein	Lactose	Urea	SCC					

If there is a sample with a "z-score" in the yellow or red area please check table VI and VII in correspondence of your lab code.

G

Ranking of your lab									
Mean difference and standard deviation of difference					Indicative Limits defined in the ICAR MA SC				
Fat	Protein	Lactose	Urea	SCC	Fat	Protein	Lactose	Urea	SCC
					g/100g	g/100g	g/100g	mg/dl	SCC*1000/ml
					d=0,02	d=0,025	d=0,10	d=2,5	d=10%
					sd=0,03	sd=0,020	sd=0,10	sd=1,5	sd=10%
					Note :	Limits are only indicative and so far do not constitute standard values; they indicate what is normally reachkable by labs for their self evaluation			

If d and sd are in the limit (see Table I and Figure 1) the cells are in green

Legenda:

- positive performance for all the sample
- same sample showed a performance out of range or there are miss data
- The parameter was not analyzed

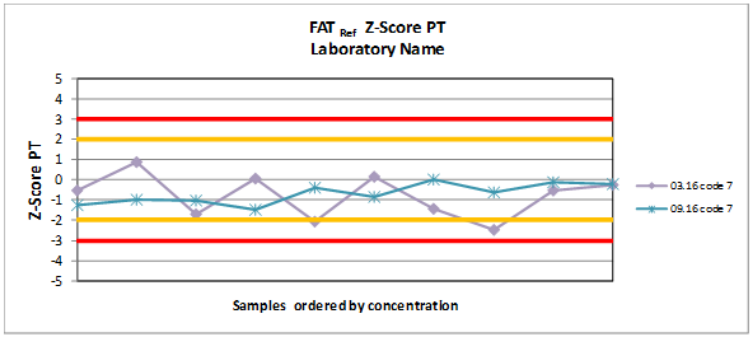
Participante ICAR PT Reports (3)

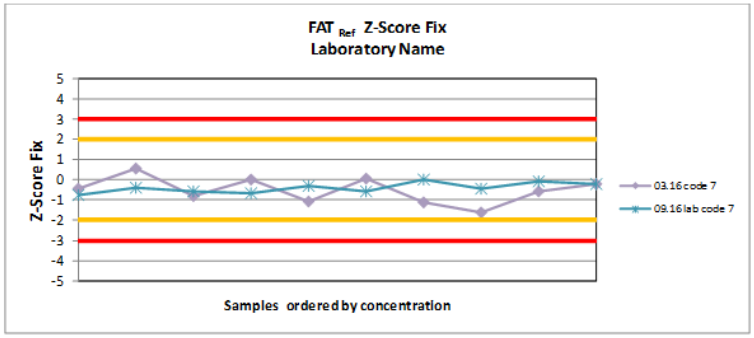
Carte di controllo

H

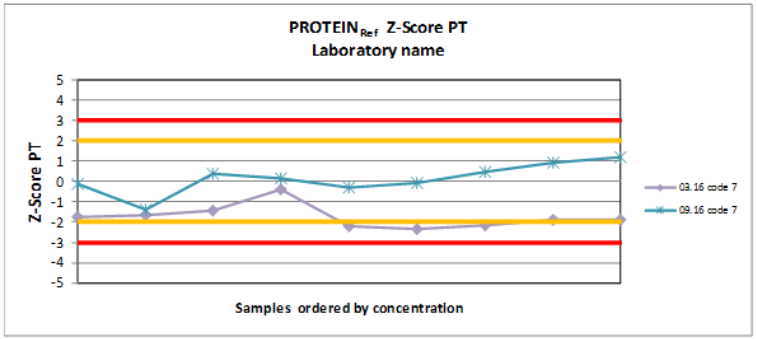
Control Charts

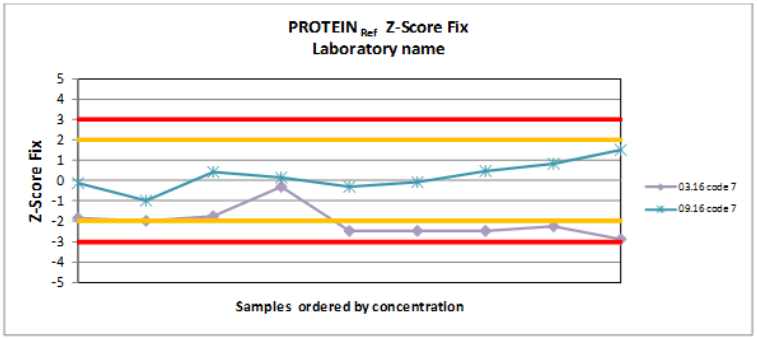
Control Charts Fat



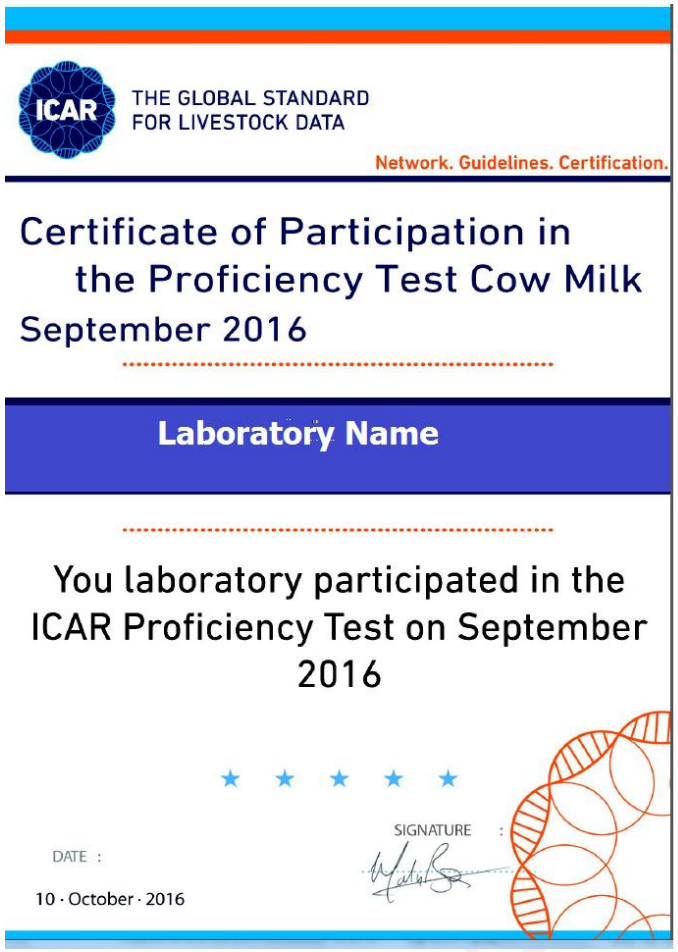


Control Charts Protein





Certificato di Partecipazione



THE GLOBAL STANDARD
FOR LIVESTOCK DATA

Network. Guidelines. Certification.

Certificate of Participation in
the Proficiency Test Cow Milk
September 2016

Laboratory Name

You laboratory participated in the
ICAR Proficiency Test on September
2016

★ ★ ★ ★ ★

SIGNATURE :

DATE :

10 · October · 2016

Valutazione ICAR

Precision

Reference methods

	FAT		PROTEIN		LACTOSE		UREA		SCC			
	sr	SR	sr	SR	sr	SR	sr	SR	sr	%	SR	%
March 2016	0,005	0,015	0,009	0,021	0,01	0,047	0,39	1,32	14.000	2%	76000	3%
September 2016	0,005	0,015	0,009	0,019	0,014	0,069	0,5	1,51	14.000	3%	86000	16%
ISO Values	0,015	0,020	0,014	0,018	0,022	0,047	0,543	1,810	18.000	10%	86000	16%

Alternative methods

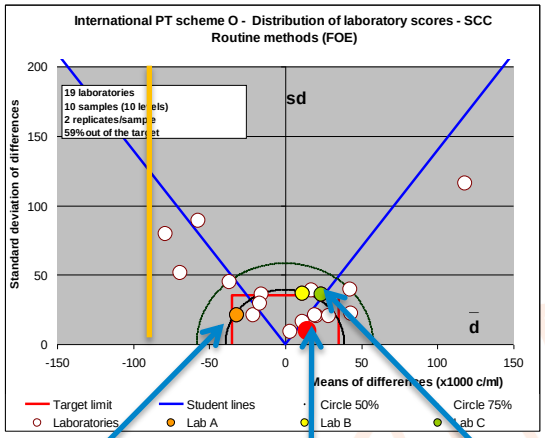
	FAT_{IR}		$PROTEIN_{IR}$		$LACTOSE_{IR}$		$UREA_{IR}$	
	sr	SR	sr	SR	sr	SR	sr	SR
March 2016	0,009	0,029	0,006	0,037	0,007	0,099	0,88	3,28
September 2016	0,005	0,034	0,006	0,057	0,006	0,116	1,09	3,5
ISO Values	0,014	0,039	0,014	0,039	0,014	0,039	0,543	1,810

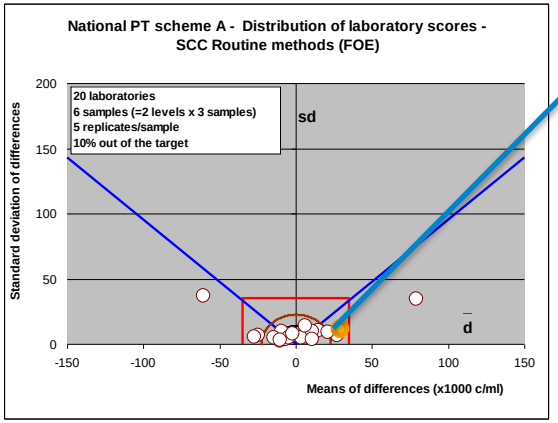
Popolazione ICAR.....

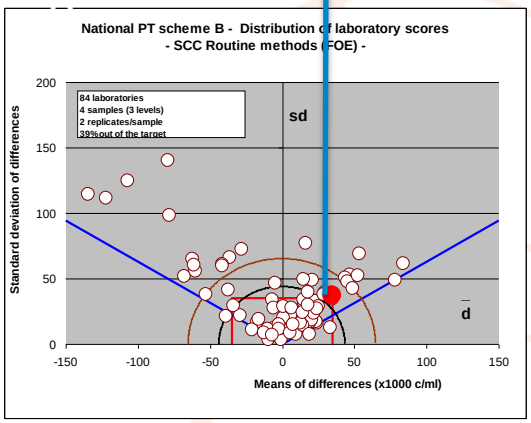
- I partecipanti del PT ICAR appartengono a.....

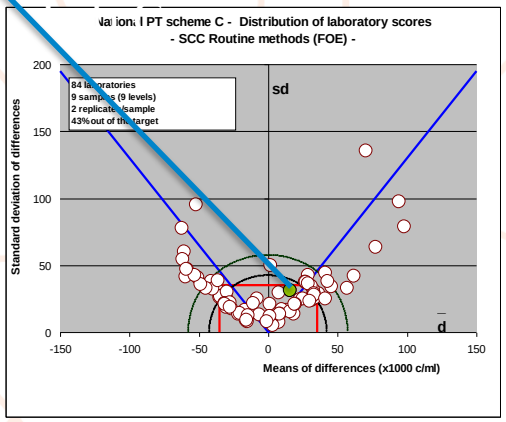
45 Partecipanti – 35 Paesi- 5 Continenti

Grazie al PT ICAR ci stiamo avviando verso un sistema di ancoraggio internazionale

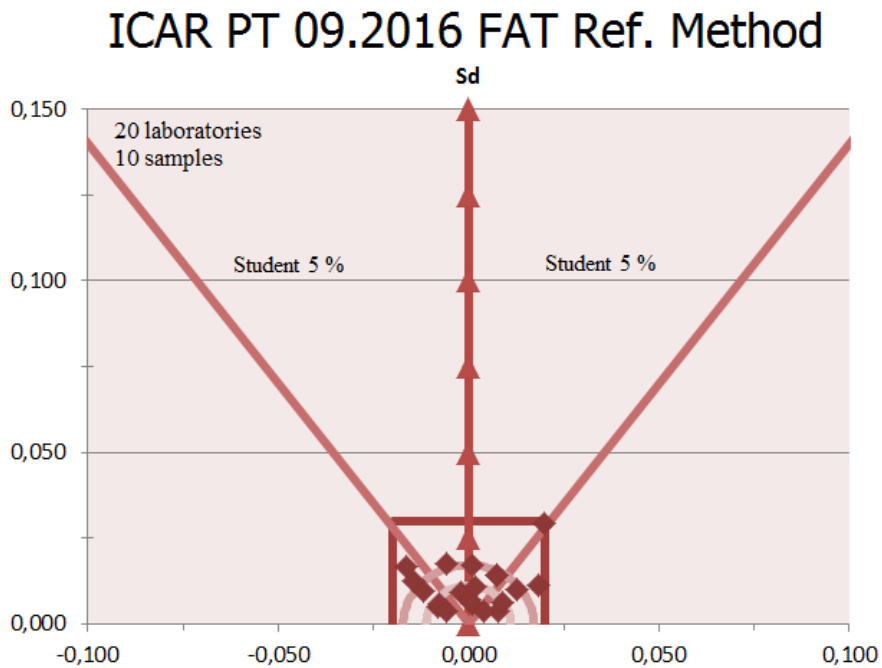




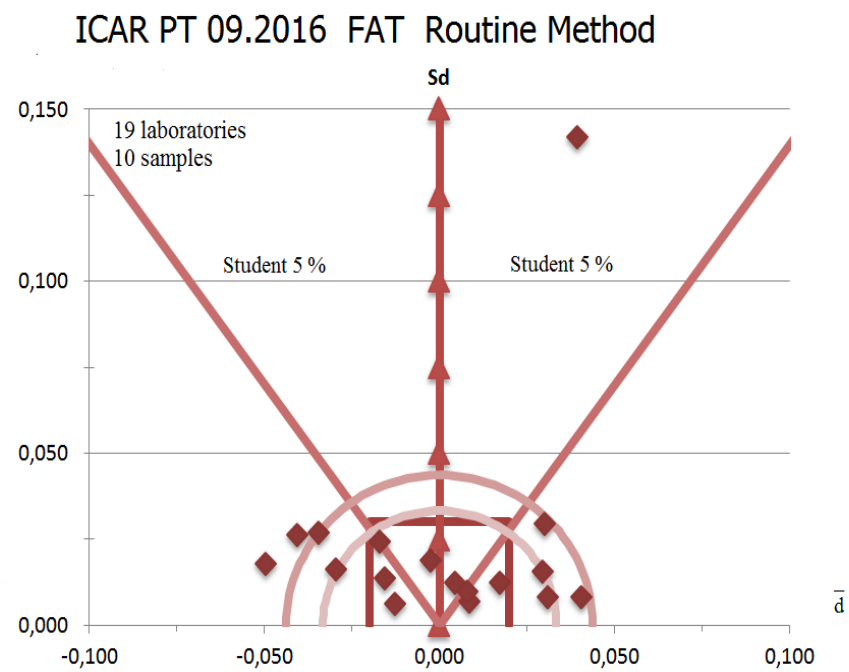




ICAR risultati e distribuzione(1)

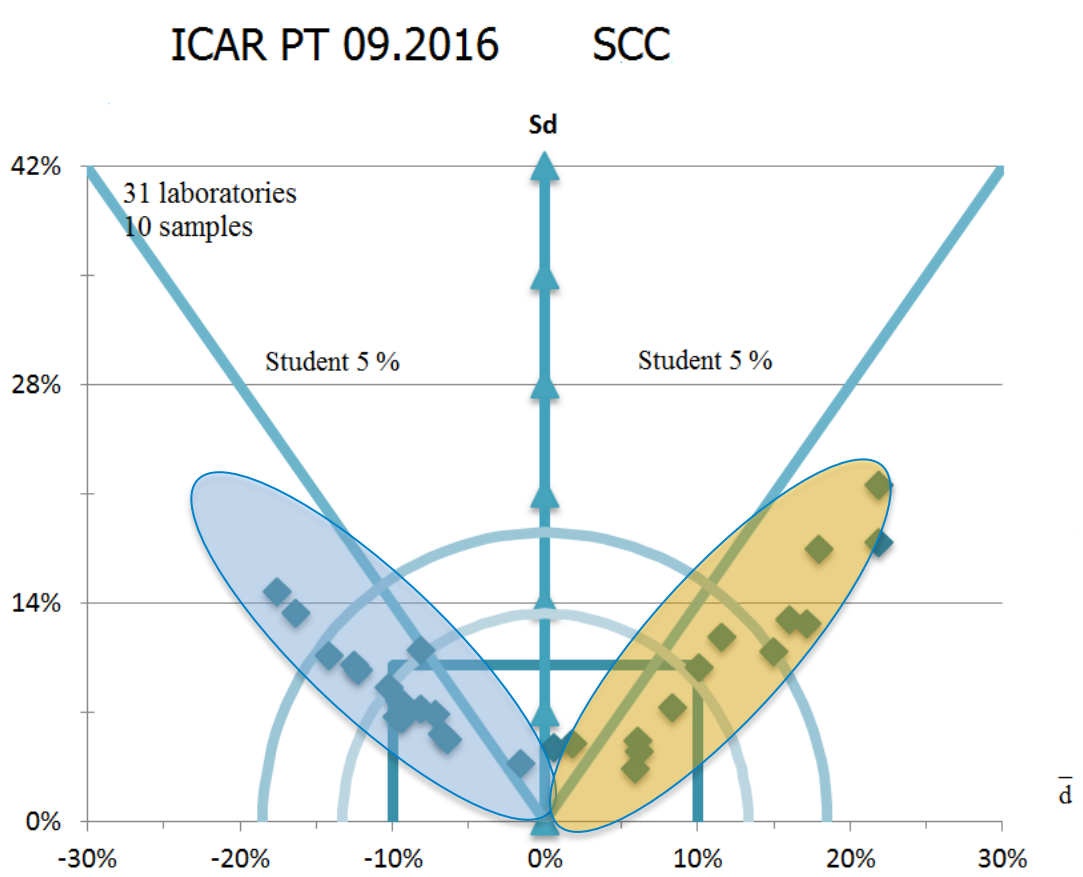


0% out of the target



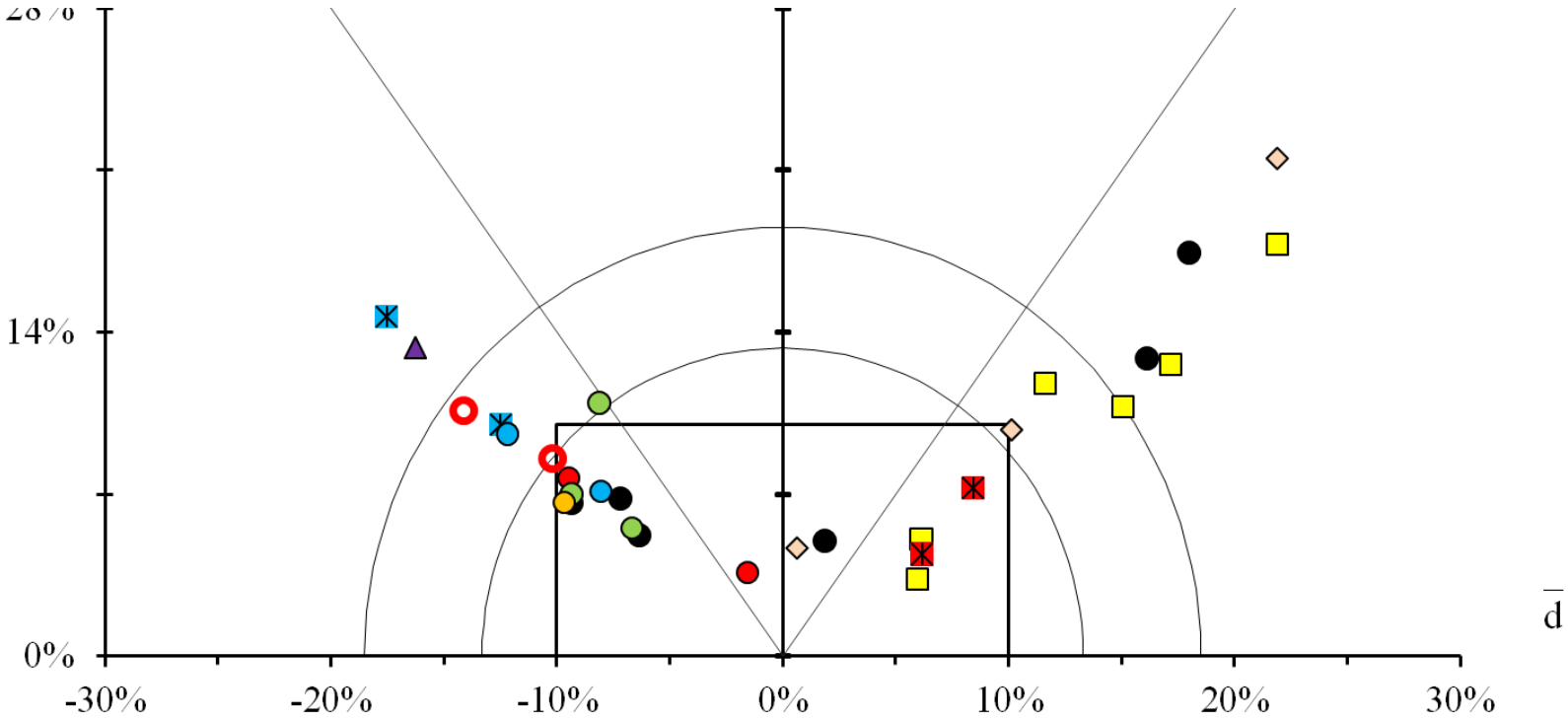
61%=11 labs out of labs out of the target

Valutazione ICAR risultati e distribuzione (2)



52%=16 labs out of the target

Valutazione ICAR Distribuzione MRs (3)



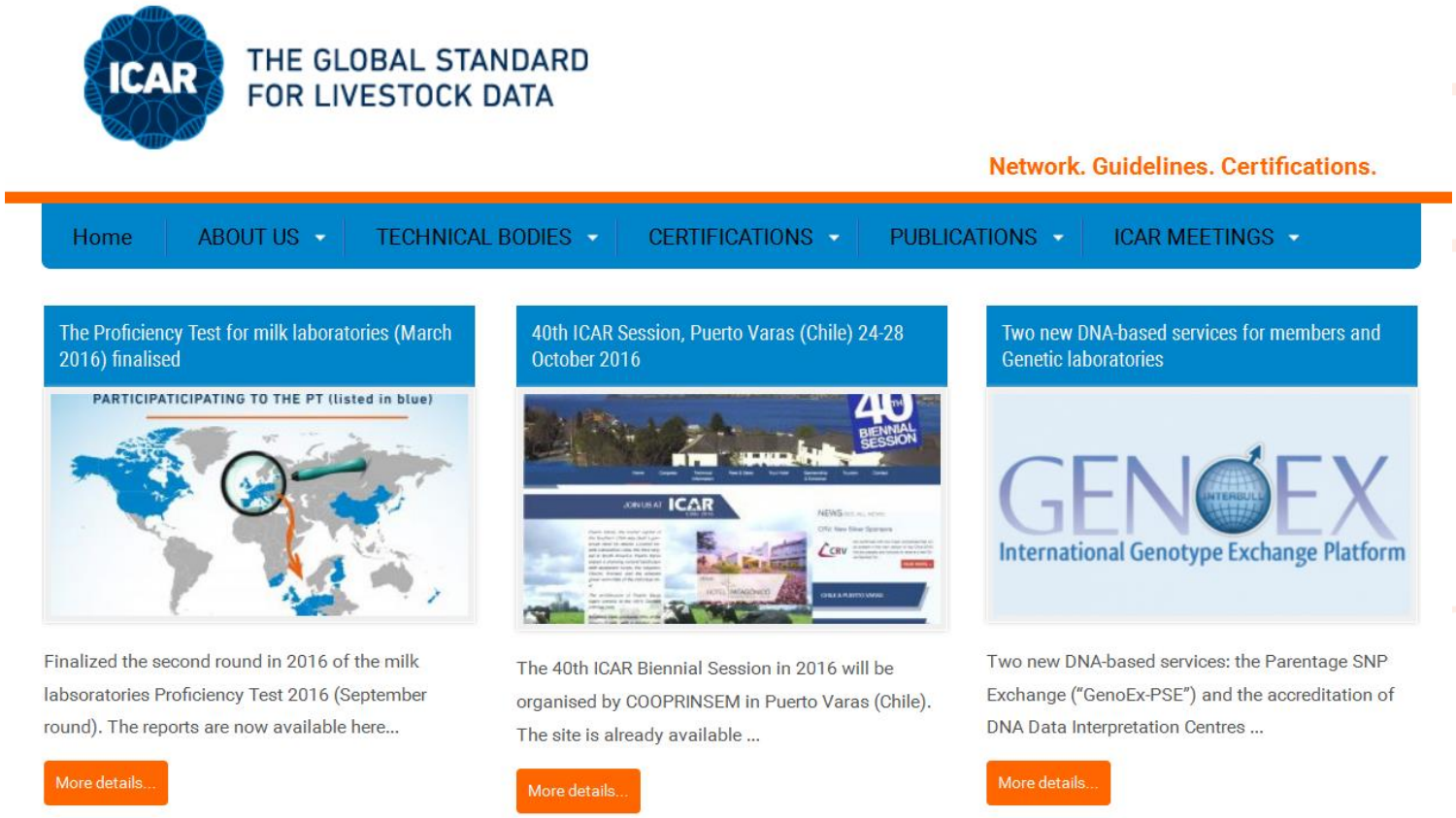
Collaborazione ICAR - IDF

Project „Reference System on Somatic Cell Counting“

....verrá illustrato nella presentazione successiva

Come Partecipare

- Visitate the ICAR website www.icar.org



Certificazione internazionale ICAR di Strumenti Analisi Latte

Milk Analysers and ICAR Certification

ICAR is pleased to announce that from March 2017 ICAR offers the possibility to certify milk analysers in accordance to the ICAR "**Protocol for evaluation of milk analysers**" (**available here**) developed and endorsed by the ICAR Milk Analysis Sub-Committee.

It is an international harmonised protocol that serves the interest of milk recording world-wide.

In the last years we assisted to a rapid development of automated analytical methods in milk analysis for milk payment and milk recording. As a consequence of such changes, high speed instruments can efficiently provide results for fat, protein, lactose, somatic cell count, urea

What's new

Latest news from ICAR available here .... : New ICAR certification for the milk analysers [...]

Read more...

ICAR Certifications

According to ICAR standards, ICAR certifies ear tags, RFIDs, milk meters and genetic laboratories. ICAR [...]

Read more...

ICAR Recording Guidelines

ISO 8196-3 IDF 128-3 :2009

In Vigore

National val.		
Phase I	Phase II (2 months)	Phase II (2 months)

National val.		
Phase I	Phase II (2 months)	Phase II (2 months)

National val.		
Phase I	Phase II (2 months)	Phase II (2 months)

Validazione Internazionale

=

Protocollo ICAR

ISO 8196-3 IDF 128-3

In Corso di revisione

Basic Validation

National val.

Phase I

Accuratezza si calcola dal confronto tra metodi chimici e metodi di routine

National val.

Phase II

(2 mesi)

Paese A

National val.

Phase II

(2 mesi)

Paese B

National val.

Phase II

(2 mesi)

Paese C

International validation

Routine Validation

National val.

Phase I

Accuratezza si calcola dal confronto tra metodi uno strumento nuovo ed uno precedentemente validato+ un numero minore di analisi chimiche

National val.

Phase II

(2 mesi)

Paese A

National val.

Phase II

(2 mesi)

Paese A

National val.

Phase II

(2 mesi)

Paese A

International validation

ISO 8196-3 IDF 128-3 :2009

Network. Guidelines. C

In Vigore

National val.
- Phase I
- Phase II (2 months)
- Phase II (2 months)

National val.
- Phase I
- Phase II (2 months)
- Phase II (2 months)

National val.
- Phase I
- Phase II (2 months)
- Phase II (2 months)

Validazione Internazionale

=

Protocollo ICAR

anses

Maisons Alfort laboratory for food safety

EU-RL MMP

European Union Reference Laboratory for Milk and Milk Products

- Phase I
- Phase II (2 months) Lab A
- Phase II (2 months) Lab B

ICAR FOR LIVESTOCK DATA

ISO 8196-3 IDF 128-3 *Under revision*

Basic Validation

- National val. — Phase I — Accuracy is a comparison between Chemical method and alternative method
- National val. — Phase II (2 months) — Country A
- National val. — Phase II (2 months) — Country B
- National val. — Phase II (2 months) — Country C

International validation

Routine Validation

- National val. — Phase I — Accuracy is a comparison between previous model new instrument
- National val. — Phase II (2 months) — Country A
- National val. — Phase II (2 months) — Country B
- National val. — Phase II (2 months) — Country C

International validation

The accuracy Limits has to be defined

Check List

THE GLOBAL STANDARD FOR LIVESTOCK DATA

Network. Guidelines. Certifications.

Home | ABOUT US | TECHNICAL BODIES | CERTIFICATIONS | PUBLICATIONS | ICAR MEETINGS

You are here: ICAR > CERTIFICATIONS > Milk analysis laboratories certifications > Milk Analysers and ICAR Certification

Enter Search...

Milk Analysers and ICAR Certification

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Read more...

ICAR Recording Guidelines

THE GLOBAL STANDARD
FOR LIVESTOCK DATA

Network. Guidelines. Certification.

Grazie per l'attenzione....

Via Savoia 78, esc.A, int.3, piano 1
I–00198 Rome, Italy
tel. +39 - (0)685 127 231 / (0)685 237 237
fax : +39 - (0)623 315 553
e-mail: elena@icar.org
www.icar.org

.....To be continued....

IRISH CATTLE BREEDING FEDERATION

The setting up of an intergrated database for the performance recording and genetic evaluation of dairy cattle in Ireland.

Martin Burke, ICBF Breeding Information Services Manager 2001 - 2012

Acknowledging colleagues; Andrew Cromie, Pat Donnellan, Kevin Downing

ICBF.com

Ireland's Cattle Industry

- 1.1 million Dairy cows
  - Export of manufactured products
  - Good margins
  - No. Quotas since Apr 2015
  - DAF 'Harvest 2020' +50% output

Ireland's Cattle Industry

- 0.9 million Suckler cows
  - Many small herds (<10 cows) and few large herds
  - Calves:
    - 22% replacements
    - 16% live exports to mostly EU countries
    - 62% slaughtered in Ireland mostly for export as cuts
  - Margins less

Irish Cattle Breeding Federation Society Limited (ICBF)

- ***Established with interim Board in 1997***
- ***Commenced operations in 1998***
- ***Joined ICAR 1998***
- ***Current structure in 2000***
- ***Mission: achieving the greatest possible genetic improvement in the national cattle herd - Dairy and Beef***

ICBF Structure

- **ICBF is owned by four organisations**
  - **AI**
  - **Milk recording**
  - **Herdbooks**
  - **Farm organisations**
- **Board made up of representatives from these organisations**
- **Board dictate ICBF policy**
- ***ICBF is owned and controlled by farmers***

MEMBERS AND BOARD OF ICBF

Board of 16 | Shares

AI

3 | 18%

Munster AI
1 - Dairygold
2 - Kerry
3 - SWS
4 Progressive Genetics
5 Dovea AI

Milk Recording

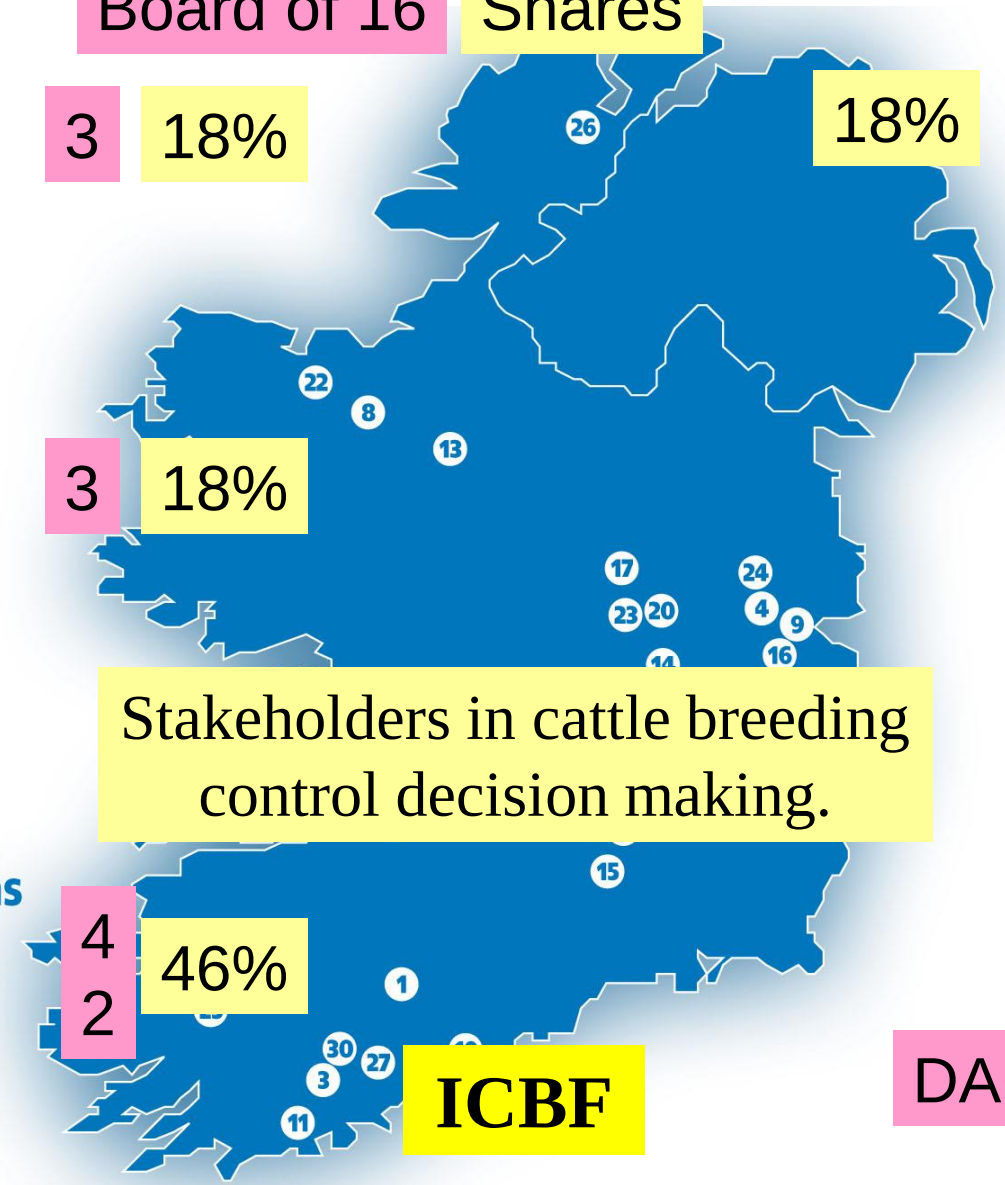
3 | 18%

1
2 munster cattle breeding group
3
4 Progressive Genetics
6 Arrabawn
7 Tipperary
8 Connacht Gold

Farm Organisations

4 | 46%
2

9 IFA
10 ICMSA



Stakeholders in cattle breeding control decision making.

ICBF

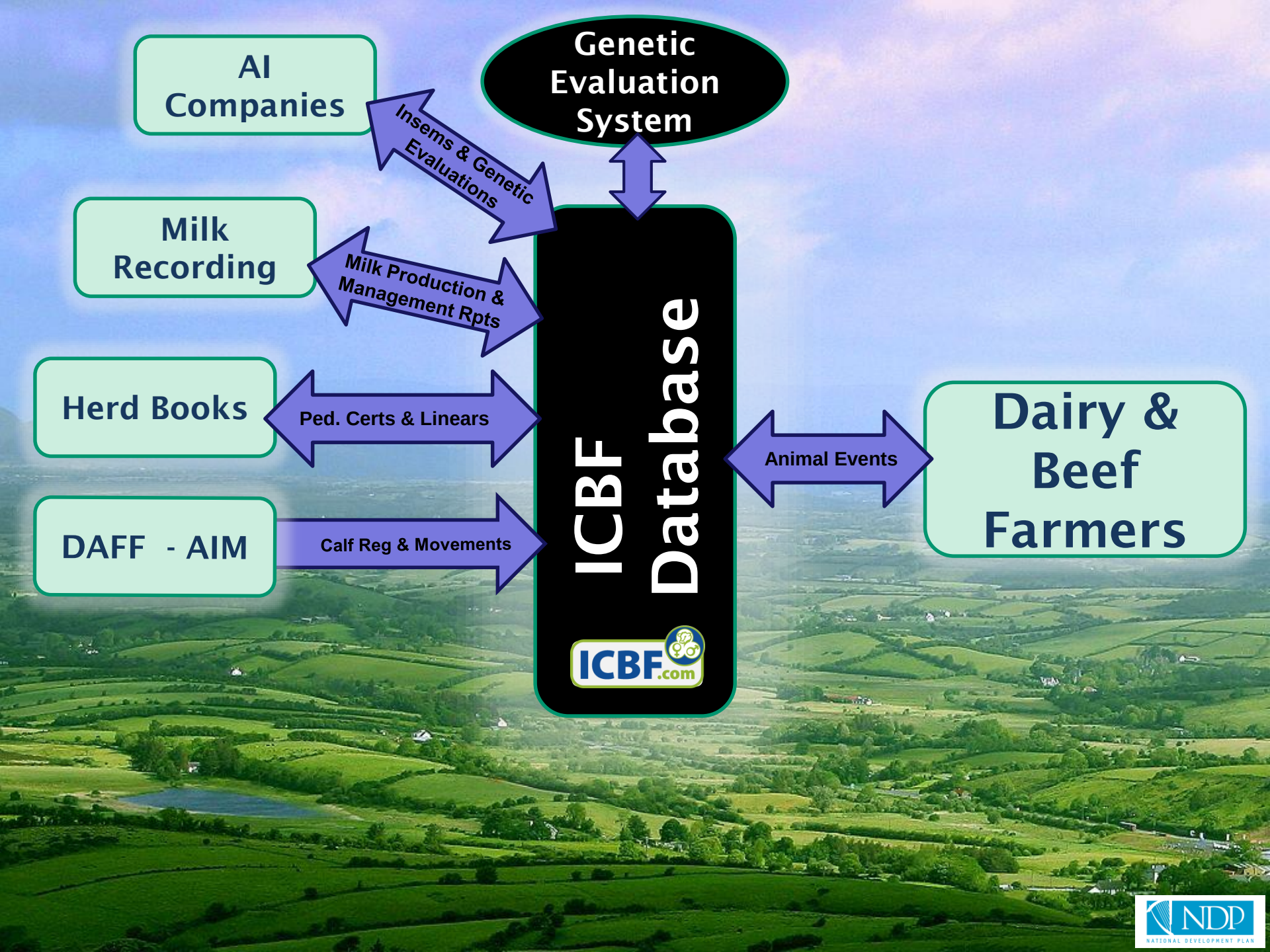
18% | 3

Herdbooks

Holstein Friesian 11
Belgian Blue 12
Angus 13
Aubrac 14
Blonde d'Aquataine 15
Charolais 16
Hereford 17
Limousin 18
Normande 19
Parthenais 20
Piedmontese 21
Shorthorn 22
Simmental 23
Jersey 24
Kerry 25
MRI 26
Montbeliarde 27
Rotbunt 28
Saler 29

DAF 1

ICBF 30


AI Companies
Genetic Evaluation System
Insems & Genetic Evaluations
Milk Recording
Milk Production & Management Rpts
Herd Books
Ped. Certs & Linears
DAFF - AIM
Calf Reg & Movements
ICBF Database
ICBF.com
Animal Events
Dairy & Beef Farmers
NDP
NATIONAL DEVELOPMENT PLAN

Data & Information Sharing Agreement

- Contributors retain ownership
- Farm data through “Animal Events”
- Electronic sharing of data collected
- Data for research
- Integrated genetic evaluations
- Herd owner controls access
- Information for service providers
- HerdPlus® - information of herd owner on web
- User-pays & full cost recovery

Database – single source – without duplication

Source of data	Type of data
Farms	**Animal events – birth, calving, weights, docility,**
DAFF – official system	**Registrations, movements, deaths, exports …**
Meat Factories	**Slaughter (date, weight, grade …), Images**
Marts	**Sale (date, weight, price …)**
AI	**Insemination (date, sire)**
Milk Recording	**Milk weight**
Laboratories & Milk Processors	**Milk composition, disease test results, genotypes**
Linear scoring	**Weights, scores – beef & dairy**
Genetic evaluations	**Breeding values, reliabilities, indexes …**

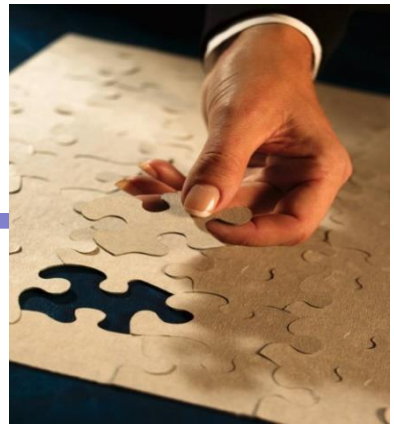
Database Information – single source – to many users

Users	Type of Information
Service providers: - Milk recording - Herd Book - AI Stud & Field - Advisory - Veterinarians - Milk processors - Researchers	· **Customer profiles** · **Service details** · **Genetic evaluations** · **Herd Books** · **Discussion Groups & Farmer Reports** · **Elite animals** · **Research results** · **Active AI bull lists** · **Raw data files for research**
Farmers direct	· **HerdPlus®- genetic evaluations, reports** · **GROW®- reports** · **G€N€ IR€LAND®- progeny test**
General public: www.icbf.com	· **Statistics, Reports, Publications …** · **Genetic Evaluations**

- Control of regulated diseases (FMD, TB, Brucellosis, BSE, …)
- Beef quality assurance
- Farmer payments
- Price reporting, …

- Cattle Breeding (Herd Books, Milk Recording, Beef Recording, Artificial Insemination, Genetic Evaluation, Breeding Schemes)
- Farm Management Information (Genetics, Reproduction, Farm Management, Advisory)
- Control of non-regulated diseases

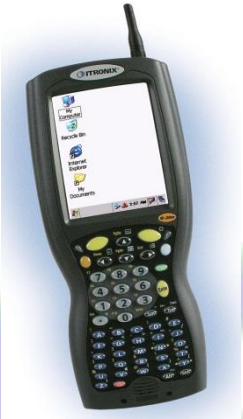
Data Recording



- Data is the lifeblood of ICBF.
- Think of the ICBF database as a huge jigsaw puzzle.
- The more pieces of the “puzzle” we have (data), the more complete the “picture” (genetic indexes) will be.
- Recording sires, calving ease, liveweights, inseminations etc. all feed into genetic evaluations.
- How we collect data must be streamlined and “farmer efficient”….

Technologies for data collection

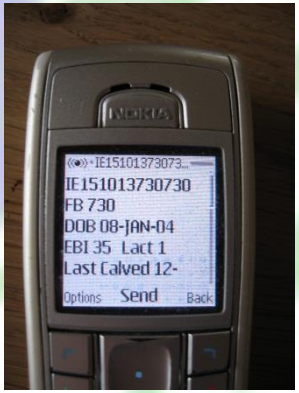
- **Hand held technologies…**
  - **Milk recording (electronic meters)**



eds)

s)

All made much easier by having an integrated database



HerdPlus® Products

EBI REPORT

CALVING REPORT

PERSONALISED POCKET NOTEBOOK

FERTILITY REPORT

BREEDING CHART

DAIRY COW REPORT

SIRE ADVICE

STOCK/NITRATES REPORTS

GENOTYPING SERVICE

Farmer Web €100 PER YEAR

Helpdesk Support Lo-call 1850 600 900

Irish Cattle Breeding Federation

Striving to achieve the greatest possible genetic improvement in the national cattle herd for the benefit of Irish farmers, the dairy and beef industries and members. Learn more about ICBF.

Home | Services | News & Publications | About ICBF

Services

- HerdPlus Sign-up
- G€N€ IR€LAND
- Genetic Evaluations
  - Farm Software Bull Files
  - Active Bull Lists
- Genomic Selection
  - Beef
  - Dairy
- Tully Beef Centre
- GROW
- Milk Recording
- Herdbook Services
- Suckler Scheme

Sheep Ireland www.sheep.ie

AHI Animal Health Ireland.ie

Discussion Group Competition Sign Up Form

ICBF Sign Up Form

Publications

- This Week's Report (pdf)
- Past Weekly Reports
- Cattle Statistics
- National Statistics
- Annual Reports
- Academic Papers
- Glossary

Learn more about ICBF

- Contact Information
- Costs and Benefits
- The Database
- Members
- Structure
- International Representation
- Legal and Privacy

Any comments on the new icbf website can be submitted here

HerdPlus Profit through Science

Online Services

User name

Password

Log In

Where do I get my username and password?

Experiencing problems - Click Here

Register your Organisation

Bull Search

Search by:

Ai Code, Tag, Herd Book No, ITT

Name or part of name

Search

Active Bull Lists

Farmer Login with username and password

Bull Search


ICBF.com
Irish Cattle Breeding Federation
Get Connected:
Home
News
Genetic Evaluations
HerdPlus
Services
Publications
About ICBF
Search ICBF.com
Beef Euro-Star Frequently Asked Questions
Reliability? Maternal and Terminal indexes? - All your questions answered.
Dairy Gene Ireland – Spring 2014
Bull of the week – Perlou
Gene Ireland Bull Breeder of the week – Jim
ONLINE SERVICES
User name
TSLEVIN
Password
LOG IN
Forgot your password?
Login Help Video
BULL SEARCH
Search By:
Code, Tag, Herd Book
Name or part of name
SEARCH
Active Bull Lists

Bull Search

Irish Cattle Breeding Federation

Animal Details

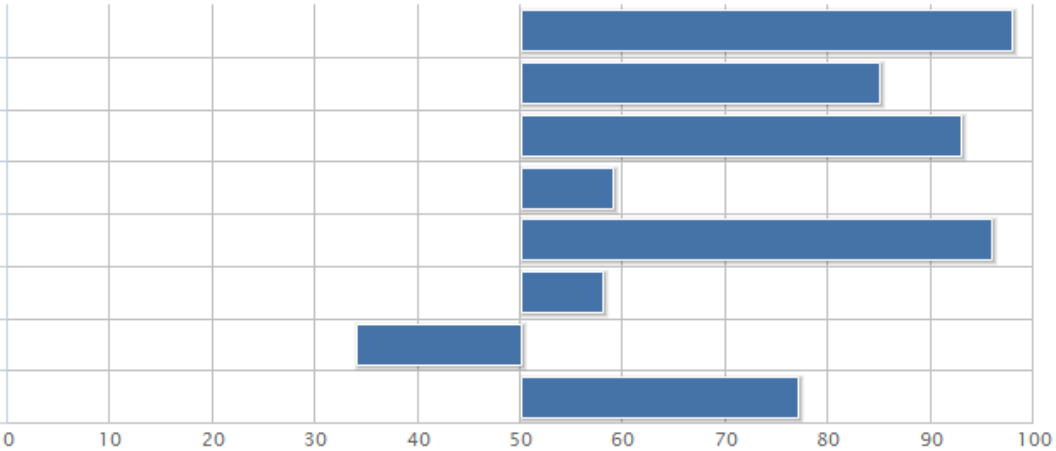
AI Code:	CVX	Breed:	HO (90.63%), FR (9.38%)	Pedigree Status:	PED
Animal Name:	(IG) CURRA CONOR	Owner:	NATIONAL CATTLE BREEDING CNTR	Sire:	MASCOL / MCL
National ID:	IE351066120707	Date of Birth:	11-MAR-2008	Dam:	CURRA RED ANNE
International ID:					SPEKTRUM PIGEOI

Over 1m hits in 2013

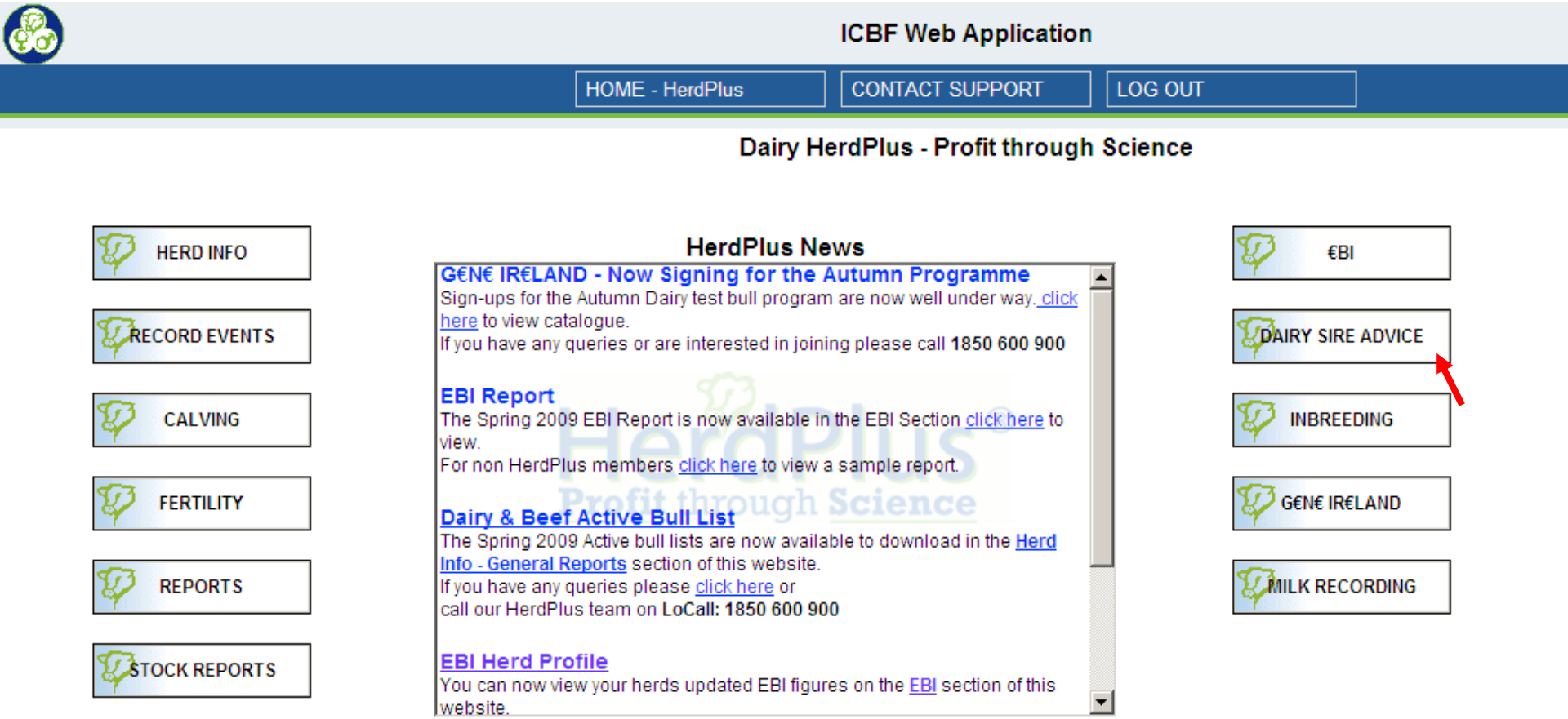
Note: The genetic

EBI Summary | Milk | Fertility | Calving | Beef | Health | Type | Pedigree | Previous Evaluation

Index	Euro	Rel
EBI	261	72%
Milk Sub Index	75	88%
Fertility Sub Index	135	52%
Calving Sub Index	34	90%
Beef Sub Index	6	87%
Maintenance Sub Index	6	63%
Management Sub Index	0	56%
Health Sub Index	5	66%



Sire Advice


ICBF Web Application
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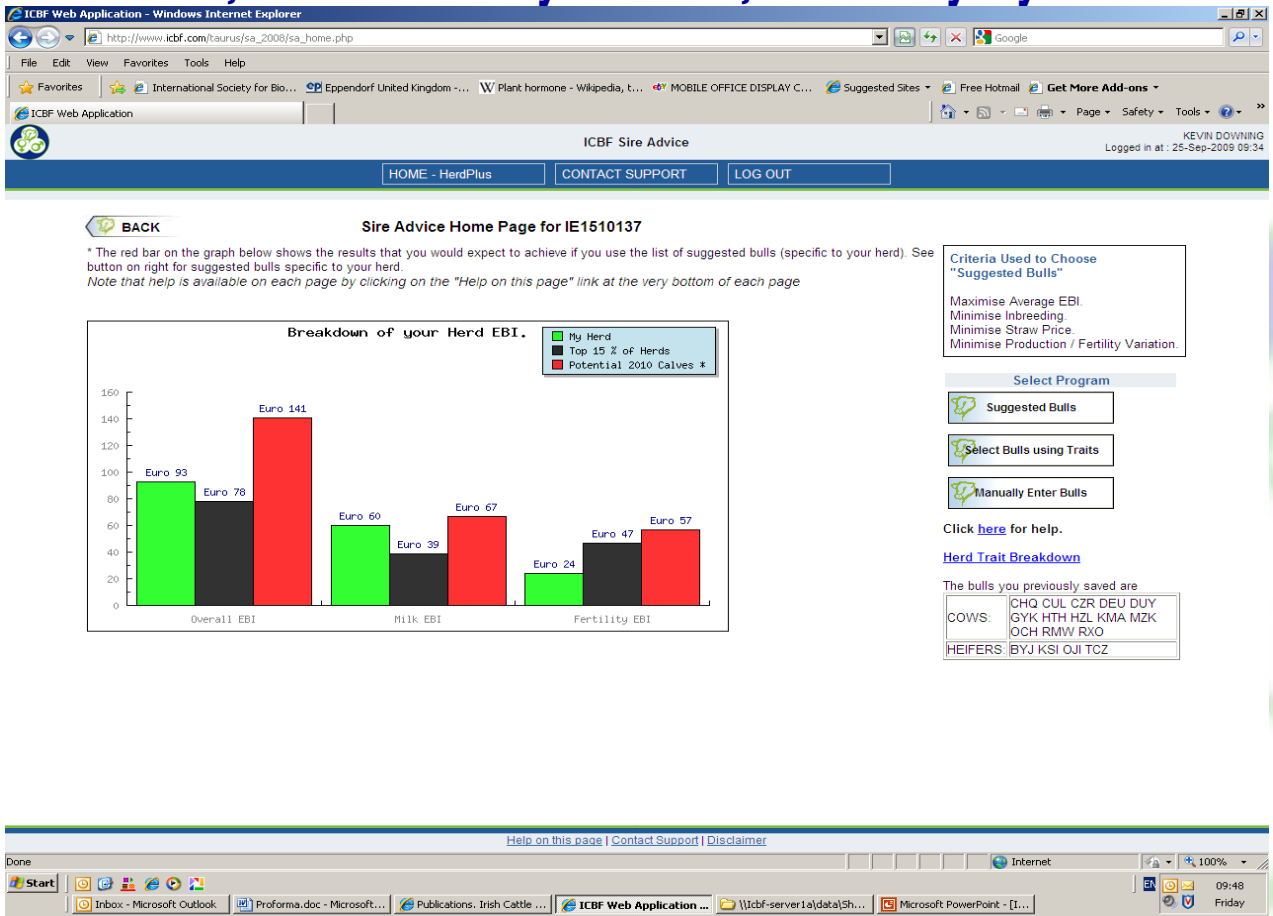
CONTACT SUPPORT
LOG OUT
Dairy HerdPlus - Profit through Science
HERD INFO
RECORD EVENTS
CALVING
FERTILITY
REPORTS
STOCK REPORTS
HerdPlus News
G€N€ IR€LAND - Now Signing for the Autumn Programme
Sign-ups for the Autumn Dairy test bull program are now well under way. click here to view catalogue.
If you have any queries or are interested in joining please call 1850 600 900
EBI Report
The Spring 2009 EBI Report is now available in the EBI Section click here to view.
For non HerdPlus members click here to view a sample report.
Dairy & Beef Active Bull List
The Spring 2009 Active bull lists are now available to download in the Herd Info - General Reports section of this website.
If you have any queries please click here or
call our HerdPlus team on LoCall: 1850 600 900
EBI Herd Profile
You can now view your herds updated EBI figures on the EBI section of this website.
€BI
DAIRY SIRE ADVICE
INBREEDING
G€N€ IR€LAND
MILK RECORDING

Sire Advice

- **Sire Advice can be run:**
- **For all AI Bulls, For all Dairy Breeds, Directly by the farmer**



Sire Advice

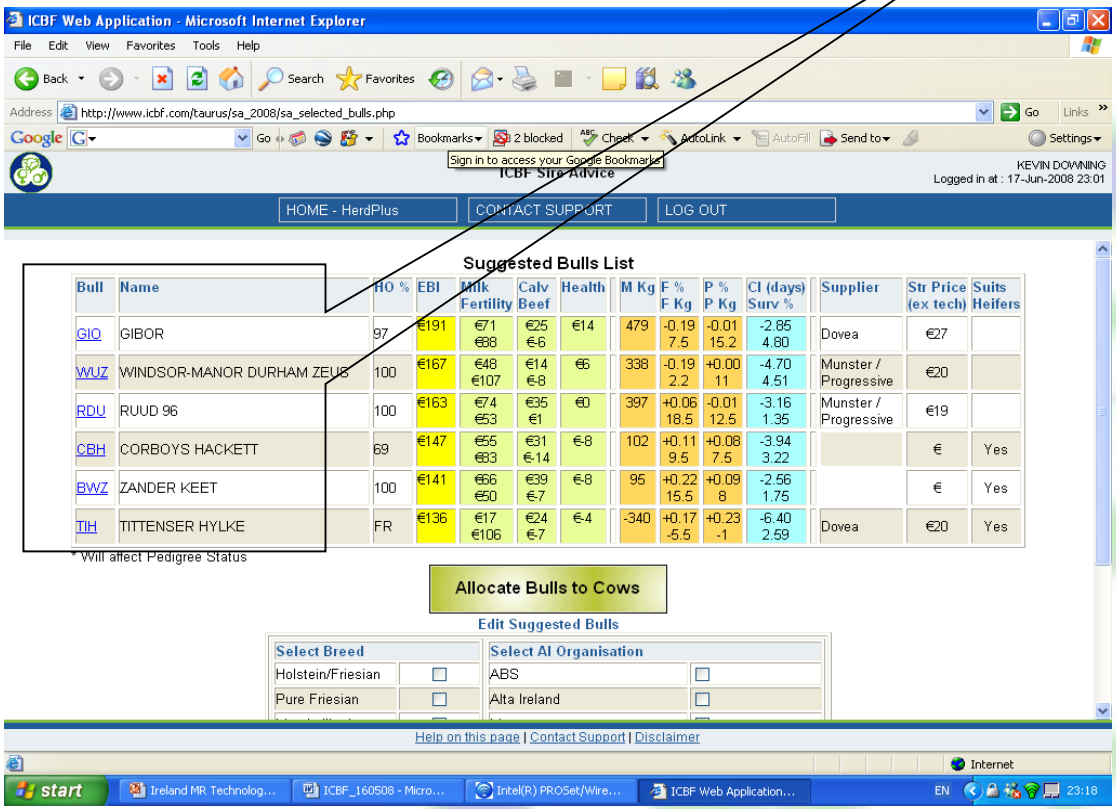
- **Sire Advice program run by breeder – if he "saves" his run, then his selected bulls get loaded to AI Handheld automatically.**

Sire Advice can be run:

- **For all AI Bulls**
- **For all Dairy Breeds**
- **Directly by the farmer**

ICBF's Suggested Bulls

- **Maximise average EBI.**
- **Min. Avg Inbreeding.**
- **Min. cost of Semen.**
- **Min. difference between Prod. & Fert. sub index.**



Bull	Name	HO %	EBI	Milk Fertility	Calv Beef	Health	M Kg	F % F Kg	P % P Kg	CI (days) Surv %	Supplier	Str Price (ex tech)	Suits Heifers
GIO	GIBOR	97	€191	€71 €88	€25 €-6	€14	479	-0.19 7.5	-0.01 15.2	-2.85 4.80	Dovea	€27	
WUZ	WINDSOR-MANOR DURHAM ZEUS	100	€167	€48 €107	€14 €-8	€6	338	-0.19 2.2	+0.00 11	-4.70 4.51	Munster / Progressive	€20	
RDU	RUUD 96	100	€163	€74 €53	€35 €1	€0	397	+0.06 18.5	-0.01 12.5	-3.16 1.35	Munster / Progressive	€19	
CBH	CORBOYS HACKETT	69	€147	€55 €83	€31 €-14	€-8	102	+0.11 9.5	+0.08 7.5	-3.94 3.22		€	Yes
BWZ	ZANDER KEET	100	€141	€66 €50	€39 €-7	€-8	95	+0.22 15.5	+0.09 8	-2.56 1.75		€	Yes
TIH	TITTENSER HYLKE	FR	€136	€17 €106	€24 €-7	€-4	-340	+0.17 -5.5	+0.23 -1	-6.40 2.59	Dovea	€20	Yes

* Will affect Pedigree Status

HerdPlus Web Site offers Integrated Technologies

HerdPlus
Profit through Science

ICBF - Herd Fertility Profile - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://www.icbf.com/taurus/fert_ani_inventory_taur.php

ICBF Web Application

Martin Burke
Logged in at : 17-Jun-2008 23:01

HERDPLUS | TAURUS | SERVICES | GENE IRELAND | LOG OFF

FERTILITY

Record AI/Natural Serve | Pregnancy Check | Fertility Report | Fertility Profile | Due 1st Serve | Due Repeat

Fertility Profile for Herd

Download File

Total Number of animals:127

FB Jumbo	Animal Number	Calving Date	Lact Num	Last Served	Last Bull	Num Serves	Last Preg Diag	Days in Calf	Days in Milk	Dry Date	Exp Calving Date
958	IE151013780958		0	24-APR-08	RUU	1		54			31-JAN-09
950	IE151013790950		0	24-APR-08	TCZ	1		54			31-JAN-09
945	IE151013730945	12-MAR-08	1	24-APR-08	IVI	1		54	97		31-JAN-09
519	IE151013760519	25-FEB-08	6	24-APR-08	RUU	1		54	113		31-JAN-09
1006	IE151013771006		0	23-APR-08	TCZ	1		55			30-JAN-09
918	IE151013780										30-JAN-09
	3780										29-JAN-09
	3740										28-JAN-09
982	IE151013780										28-JAN-09
978	IE151013730978		0	21-APR-08	TCZ	1		57			28-JAN-09
759	IE151013770759	22-FEB-08	3	21-APR-08	RZE	1		57	116		28-JAN-09
431	IE151013710431	23-SEP-07	6	21-APR-08	SZU	3		57	268		28-JAN-09
558	IE151013740558	15-OCT-07	3	22-MAY-08	MZY	4		26	246		28-FEB-09

Top Of Page | Contact Support | Disclaimer

Done | Internet

Serves get automatically loaded to database from AI Handheld when technician powers off.

HerdPlus
Profit through Science

End of Season Fertility Report Spring 2009

LoCall 1850 600 900

Herd Owner: SAMPLE
Herd Number: IE2345678
Report Date: 27/10/2009

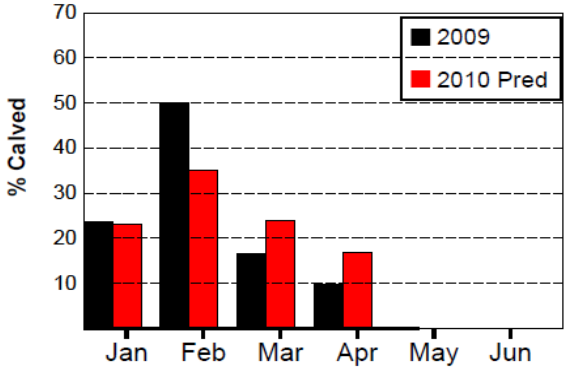
Mating Start Date (MSD):	16/04/2009 Cows	07/04/2009 Heifers	**Finish/Last Serve Date:**	10/07/2009
			Length of Breeding Season:	13 weeks + 3 days

(a). Calving Summary Data - Report is based on dairy cows that calved from 18/01/2009

	Spring Dairy Calving Dates			
	Start Calving	Median Calving[1]		Last Calving
Cows	18/01/2009	16/02/2009	(29 days)	21/04/2009
Heifers	16/01/2009	01/02/2009	(16 days)	27/03/2009
Herd	16/01/2009	11/02/2009	(26 days)	21/04/2009

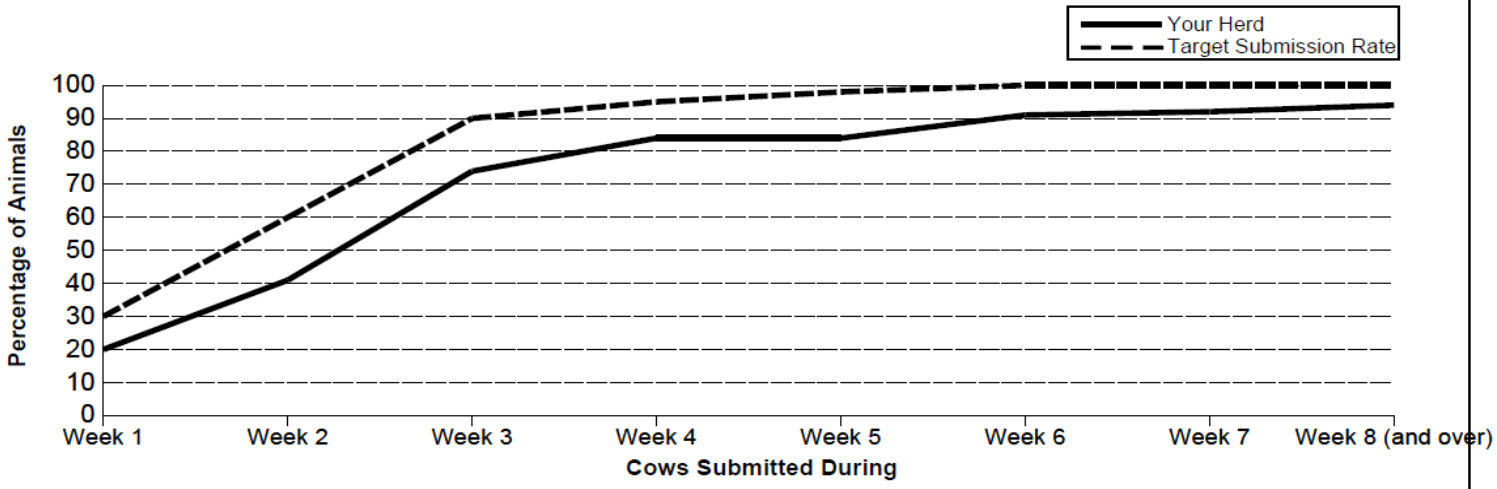
Total Dairy Calvings: 72 **Cows Calved & Served:** 62
Total Dairy Calves Born: 74 **Total number of serves:** 175

Current & Predicted Spring Calving Pattern



Explanatory Notes
[1] **Median Calving:** Date on which 50% of cows/heifers have calved as a percentage of cows/heifers calved on report date.

(b). Current Herd Submission Rate - Report is based on dairy cows that calved from 18/01/2009



HerdPlus® Overview

- HerdPlus Growth through Industry Partners

Partner	Opportunities
Teagasc (Govt advisory)	Agri. Colleges
ACA	Stock Reports, DEP & SCWS
HerdBooks	Pedigree Beef Breeder Clubs
AHI / Vets	BVD, CellCheck, Fertility
Milk processors	Co-op Performance Reports & Daily Bulk data
Marts	Catalogues & e-Displays
Others	Bord Bia, ASA, Cork CoCo, UCD, etc.

Processor Performance Report

Since 2011….Co-ops (processors) on board

glanbia

Barryroe
CO-OPERATIVE LIMITED
Lislevane, Bandon, Co. Cork
Tel: (023) 8840000 Fax: (023) 8840140
Email: barryroe@barryroeco-op.ie

Connacht Gold
Co-operative Society Ltd

Dairygold

LISAVAIRD
CO-OPERATIVE CREAMERY LTD.

Arrabawn
Co-op

TIPPERARY
COOPERATIVE

Centenary
Thurles
Co-op

Wexford Milk Producers

Drinagh

KERRY

LAKELAND
DAIRIES

Bandon co-op

TOWN OF MONAGHAN CO-OP

Milk Performance Scorecard

	Your Herd	Co-op Average	Co-op Top 10%	Your Rank out of 100	Your Star Rating[1]
Your Milk performance for 2010 (Jan - Sep) based on Co-op data					
Fat + Protein (Kg/cow) Average Fat and Protein yield per cow for your herd	283	260	329	66%	* * * *
Litres per Cow per Day Avg litres of Milk per cow from Jan - Sep 2010	12.56	13.25	16.5	38%	* *
Fat % to end September 2010 Weighted average Fat % from Jan - Sep 2010	4.43	3.73	3.94	100%	* * * * *
Protein % to end September 2010 Weighted average Protein % from Jan - Sep 2010	3.58	3.26	3.38	100%	* * * * *
Average Milk Value (cpl) Incl. VAT Average milk value received from Jan - Sep 2010, on your farm performance.	34.1	29.4	31	100%	* * * * *
SCC (,000 cells/ml) The weighted average Somatic Cell Count for Jan - Sep 2010	145	262	145	91%	* * * * *

Herd Performance Scorecard

Your Fertility & Culling based on HerdPlus 2010 Calving Report					
Calving Interval (days) Average number of days between successive calvings for cows calved during the period	380	399	365	73%	* * * *
Days to calve 50% of herd Start **16/01/2010** - Median **17/02/2010**	33	40	20	62%	* * * *
Culling Rate Number of cows culled (Factory/Died) in the period **(19)** as a proportion of eligible cows **(222)**	9%	10%	0%	50%	* * *
%AI bred replacements %female calves born in the period from dairy AI **(60)** as a proportion of eligible cows **(222)**	27%	13%	29%	87%	* * * * *
Your EBI Statistics based on Herdplus EBI Report August 2010					
Herd EBI 2010 Average EBI for cows with EBI data	€126	€66	€88	100%	* * * * *
Yearly EBI Gain (2010-2011) Gain in Herd EBI based on; 0-1yr old, 1-2yr old & 22% replacement rate	€0	€4.5	€8	12%	*
EBI of 2010 Inseminations Weighted Average EBI of dairy AI bulls recorded in Spring 2010	€192	€178	€208	66%	* * * *

[1] * = 0 - 20% * * = 21 - 40% * * * = 41 - 60% * * * * = 61 - 80% * * * * * = 81 - 100%

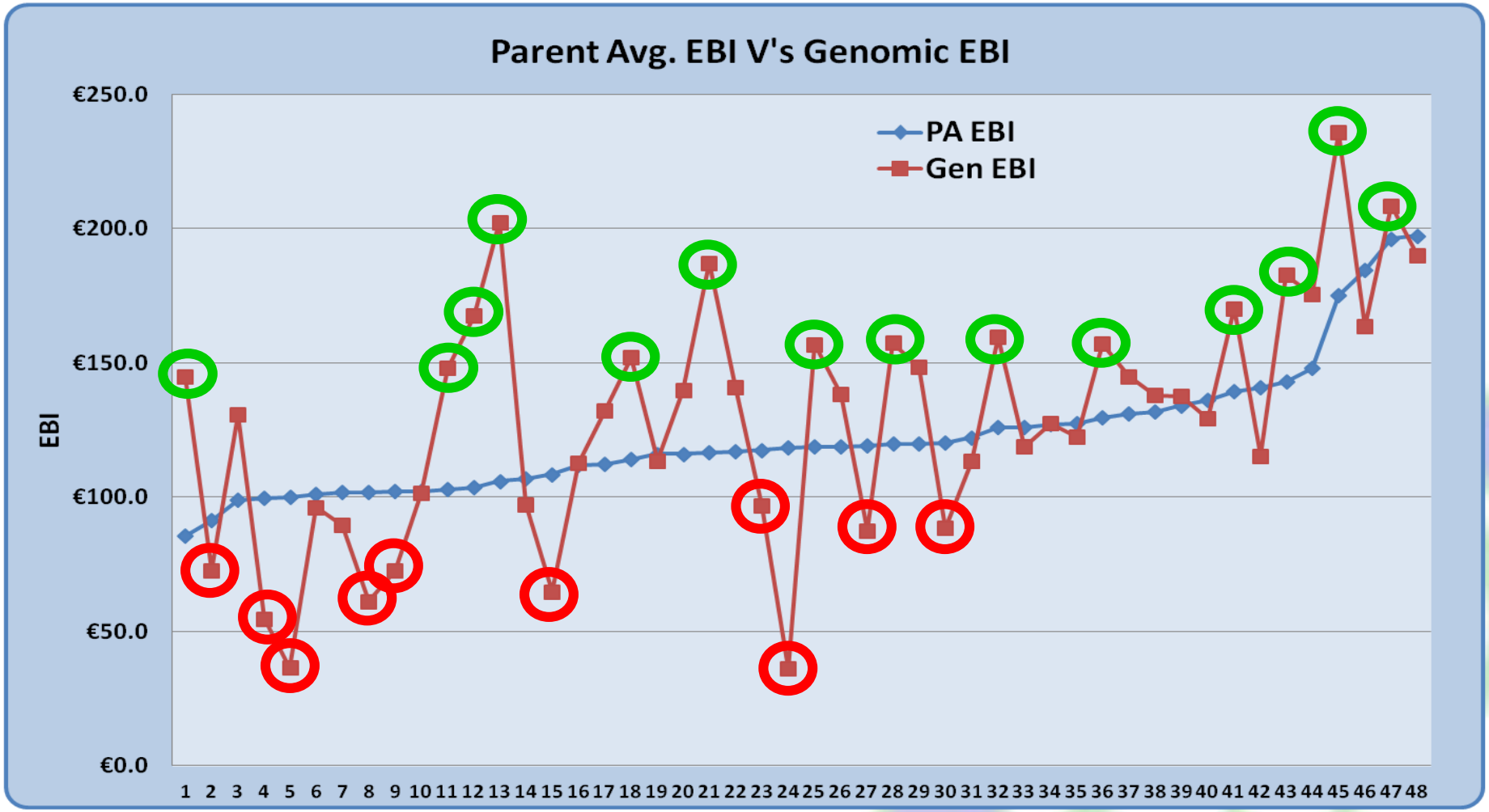
Genomics for Females

Genomic Evaluation Report

Jumbo	1281	Lact. No	
Tag	IE151013721281	Sex	F
Name		Sire	KSI (€ 122)
DOB	09-Jan-2010 1y 2m	Dam	IE151013771105 (€ 122)
Breed	HO (97%), FR (3%)	Dam's Sire	HFL (€ 150)
Date of Evaluation	29-Mar-2011		

Index	Official Genomic Evaluation	Reliability	Weighting on Genomics	DNA Value	Parent Average Evaluation	Reliability	Diff.from Parent Avg	Increase In Reliability
EBI €	**147**	**53%**	32%	127	122	31%	+25	22%
Milk Sub Index €	**52**	**63%**	41%	51	42	37%	+10	26%
Fertility Sub Index €	**91**	**43%**	26%	73	74	23%	+17	20%
Calving Sub Index €	**19**	**54%**	28%	17	20	36%	-1	18%
Beef Sub Index €	**-14**	**49%**	26%	-14	-17	31%	+3	18%
Maintenance Sub Index €	**3**	**44%**	23%	3	4	27%	-1	17%
Health Sub Index €	**-4**	**58%**	41%	-4	-3	30%	-1	28%

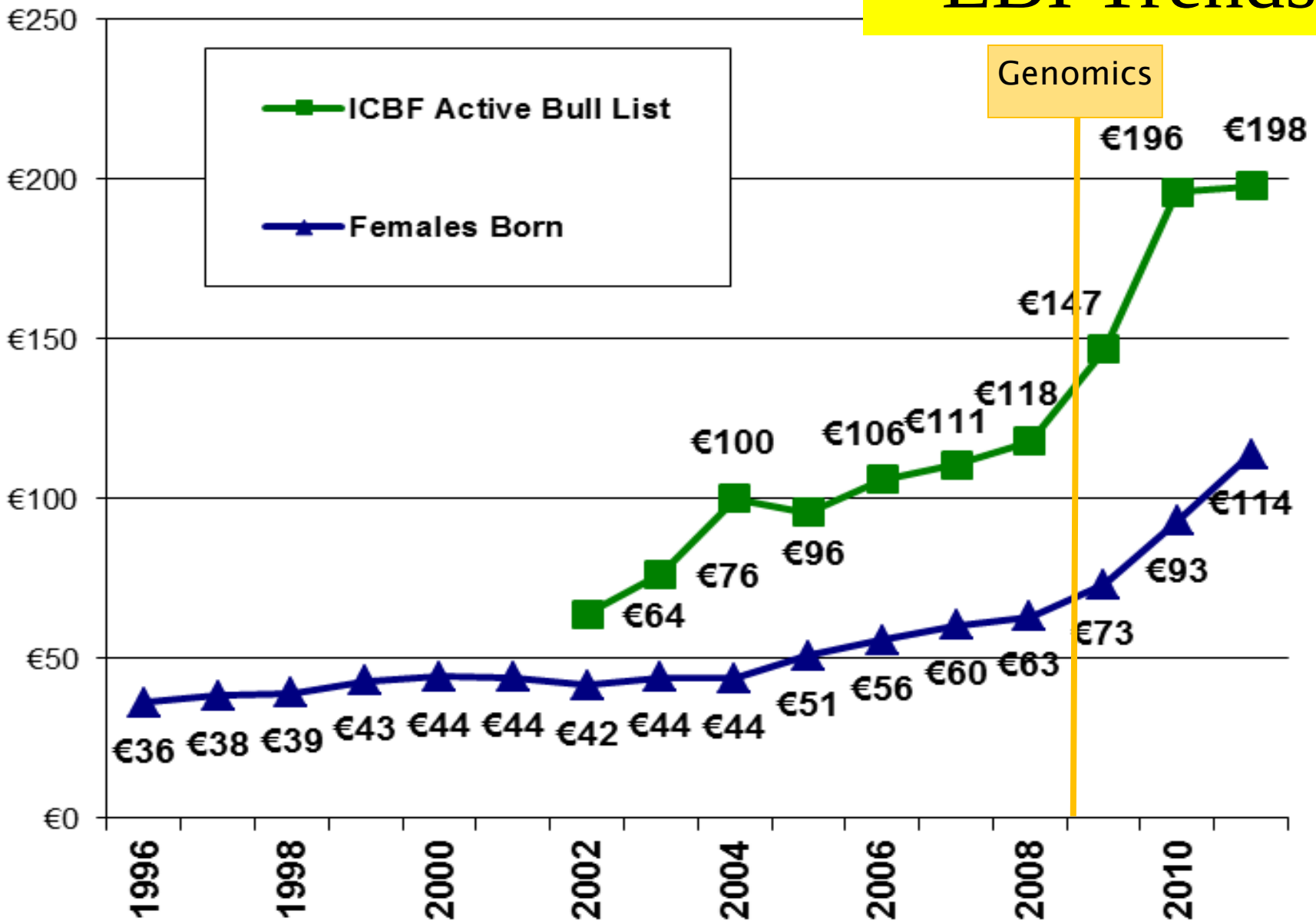
There will be re-ranking



Genetic Gain in EBI.

- Past = No genetic gain.
  - Milk gains – fertility loss.
- Now €20/year and increasing.
  - Influence of genomics.
  - Use of younger bulls
  - G€N€ IR€LAND
  - Better imported sires available

EBI Trends

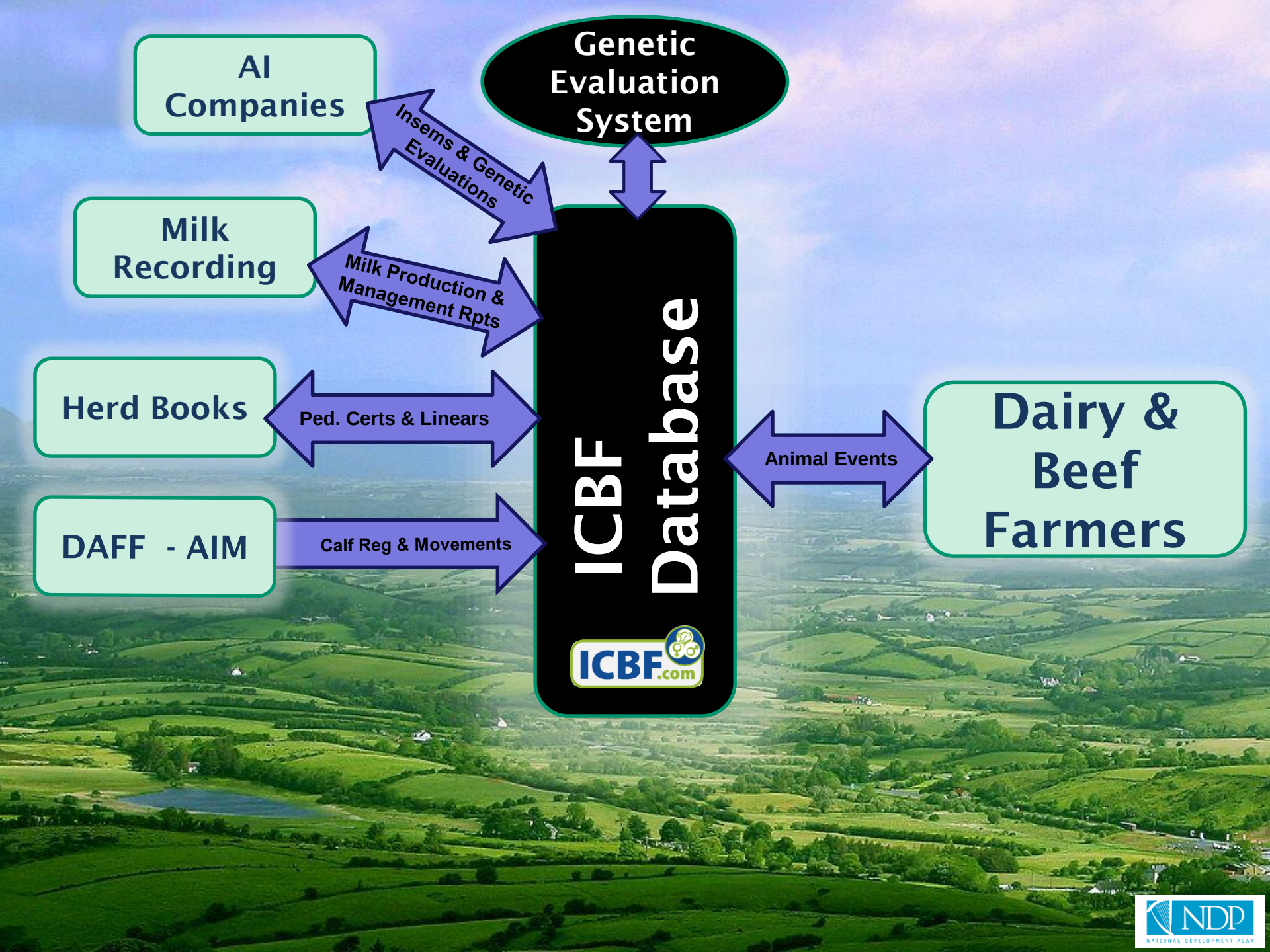

€250
€200
€150
€100
€50
€0
ICBF Active Bull List
Females Born
Genomics
€36 €38 €39 €43 €44 €44 €42 €44 €44 €51 €56 €60 €63 €73 €93 €114
€64 €76 €100 €96 €106 €111 €118 €147 €196 €198
1996
1998
2000
2002
2004
2006
2008
2010

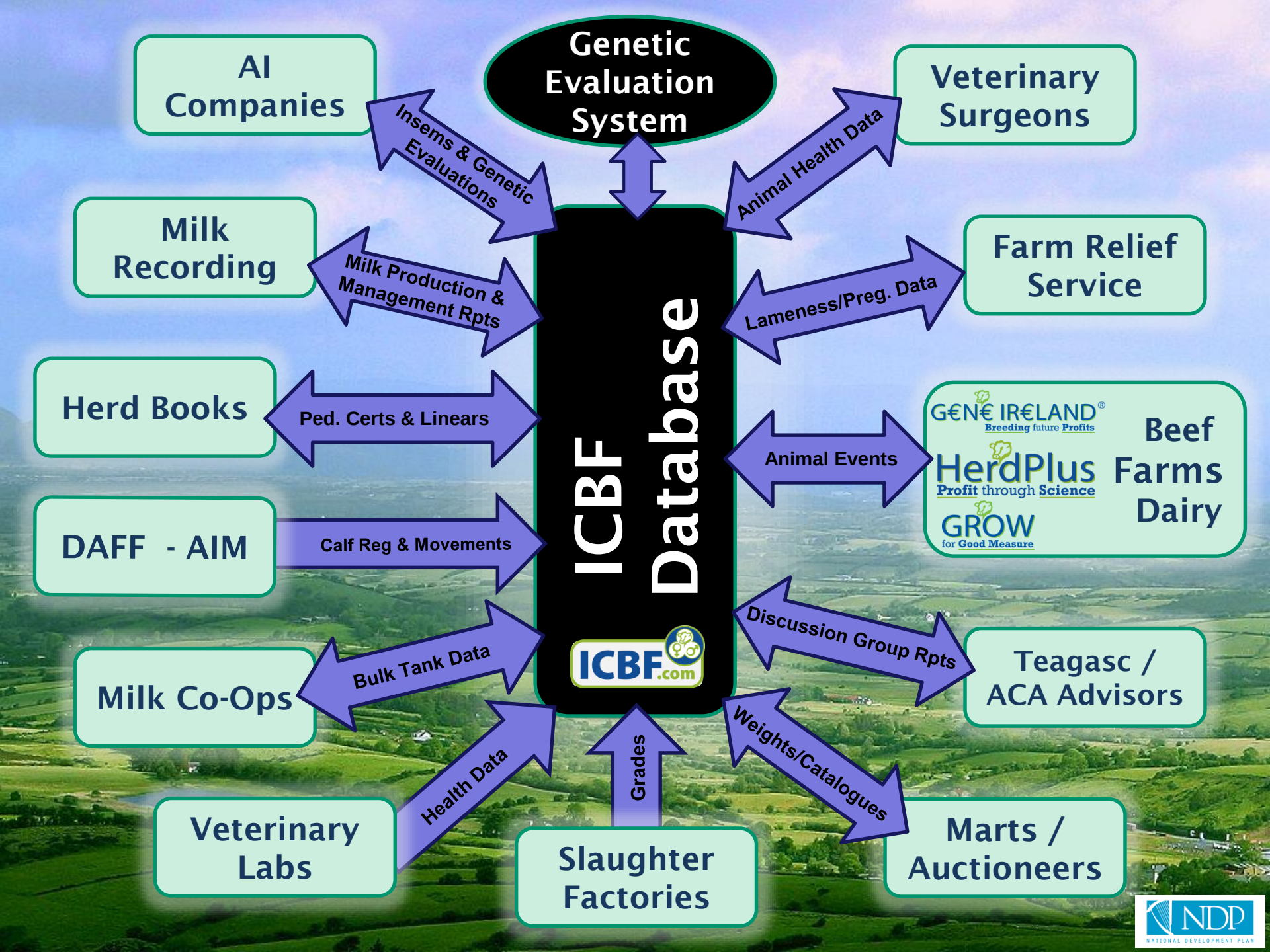
HerdPlus – Social Networks

Please Follow!

www.facebook.com/HerdPlus

www.twitter.com/HerdPlus


AI Companies
Genetic Evaluation System
Insems & Genetic Evaluations
Milk Recording
Milk Production & Management Rpts
Herd Books
Ped. Certs & Linears
DAFF - AIM
Calf Reg & Movements
ICBF Database
ICBF.com
Animal Events
Dairy & Beef Farmers
NDP
NATIONAL DEVELOPMENT PLAN


Genetic Evaluation System
ICBF Database
ICBF.com
AI Companies
Insems & Genetic Evaluations
Veterinary Surgeons
Animal Health Data
Milk Recording
Milk Production & Management Rpts
Farm Relief Service
Lameness/Preg. Data
Herd Books
Ped. Certs & Linears
Animal Events
GENE IRELAND
Breeding future Profits
HerdPlus
Profit through Science
GROW
for Good Measure
Beef Farms
Dairy
DAFF - AIM
Calf Reg & Movements
Discussion Group Rpts
Teagasc / ACA Advisors
Milk Co-Ops
Bulk Tank Data
Weights/Catalogues
Marts / Auctioneers
Veterinary Labs
Health Data
Grades
Slaughter Factories
NDP
NATIONAL DEVELOPMENT PLAN

Summary

- Animal breeding is a unique and powerful tool for improving the profitability of cattle farming.

- Irish animal breeding has been transformed through a unique partnership between farmers, the breeding industry and DAF.
- The national identification and traceability system adopted by Ireland has greatly facilitated Irish cattle breeding.
- Continued investment in cattle breeding will give excellent returns.
- The model established relies heavily on international cooperation and collaboration.
- Membership and full participation in the activities of ICAR and Interbull are fundamental to the achievements in Ireland cattle breeding.

Testing for antibiotic residues in raw milk – new developments in Germany

Mast S., Kreis B., Baumgartner C.

Overview

- Regulatory framework
  - EU
  - Germany
    - New developments
- Current situation of Inhibitor Testing in Bavaria
- New Trends in Inhibitor Testing

Regulatory framework - EU

Reg. (EC) No. 853/2004

- specific hygiene rules for food of animal origin
  - criteria for raw milk

Reg. (EC) No. 470/2009

- establishment of residue limits of pharmacologically active substances in foodstuffs of animal origin

Reg. (EC) No. 37/2010

- Classification and detailed list of MRLs for pharmacologically active substances

Regulatory framework - Germany

Animal Food hygiene regulation (Tier-LMHV)

- national executive regulation for EC regulations

Milk ordinance for quality testing and payment (MilchGüV)

- linked by § 14 of the Animal Food Hygiene Regulation ➔ national system to enact EC 853/2004 Annex III Section IX Chapter I Part III Nr. 2 letter d)

Milk ordinance for quality testing and payment (MilchGüV)

- Regulation to set minimum standards for quality testing of dairy farmer´s ex-farm milk and a frame for equal quality payment
- *Analysis criteria* (fat, protein, bacteriological quality & inhibitors, somatic cell count, freezing point)
- *Inhibitors:*
  - Method to be used: Brilliant Black Reduction Test (BRT)
    = microbiological screening test
  - Minimum number of analysis: 2 x/ month
  - Inhibitor positive result ➔ 5 ct/ kg reduction of milk price for whole month
- *Sampling:*
  - Automated sampling system installed in each bulk milk tanker
  - Supervision of function and education of truck drivers by mpr (acting as state agency for implementation of MilchGüV in Bavaria)

Revision of Milk ordinance for quality testing and payment (MilchGüV)

2017?!

Goals

- Adjustment of German raw milk testing to the requirements of EU hygiene regulations
- Adaptation to present-day situation and requirements of the industry

Revision MilchGüV

Consequences for Inhibitor Testing

Inhibitor Test systems:

- Definition of minimum test performance requirements
  - Sensitivity of screening test systems ↑

Group No.	Substance group	Test sensitivity requirement	Substances to be detected and required detection limit [µg/kg]
1	penicillines	Detection of all substances of this group	Penicillin G [4]
			Oxacillin [30]
			Cloxacillin [30]
			Amoxicillin [4]
			Ampicillin [4]
2	cephalosporines	At least 2 substances of this sub-group	Cefalexin[1] [100]
			Cefalonium[1] [20]
			Cefapirin[1] [60]
			Cefazolin[1] [50]
		At least 1 substance of this sub-group	Cefoperazon[3] [50]
			Ceftiofur[3] [100],
			Cefquinom[4] [20]
3	aminoglycosides	At least 1 substance of this group	Streptomycin [200]
			Dihydrostreptomycin [200]
			Gentamicin [100]
			Kanamycin [150]
			Neomycin [1500]

Group No.	Substance group	Test sensitivity requirement	Substances to be detected and required detection limit [µg/kg]
4	makrolide, lincosamide	At least 1 substance of this group	Erythromycin [40]
			Tylosin [50]
			Lincomycin [150]
			Pirlimycin [100]
5	sulfonamides	At least 1 substance of this group	Sulfadimidin [100]
			Sulfadoxin [100]
			Sulfamethoxypyridazin [100]
6	tetracyclines	At least 1 substance of this group	Tetracyclin [100]
			Chlortetracyclin[100]
			Oxytetracyclin[100]
7	chinolones *	At least 1 substance of this group	Enrofloxacin [100]
			Ciprofloxacin [100]
			Marbofloxacin [75]

* Chinolones tested at least twice per year with ELISA tests, as microbiological tests do not reach required test sensitivities

Revision MilchGüV

Consequences for Inhibitor Testing

Inhibitor Test systems:

- Definition of minimum test performance requirements
  - Sensitivity of screening test systems ↑
- Detailed definition of requirements for authorisation/ validation/ batch controls/ proficiency trials

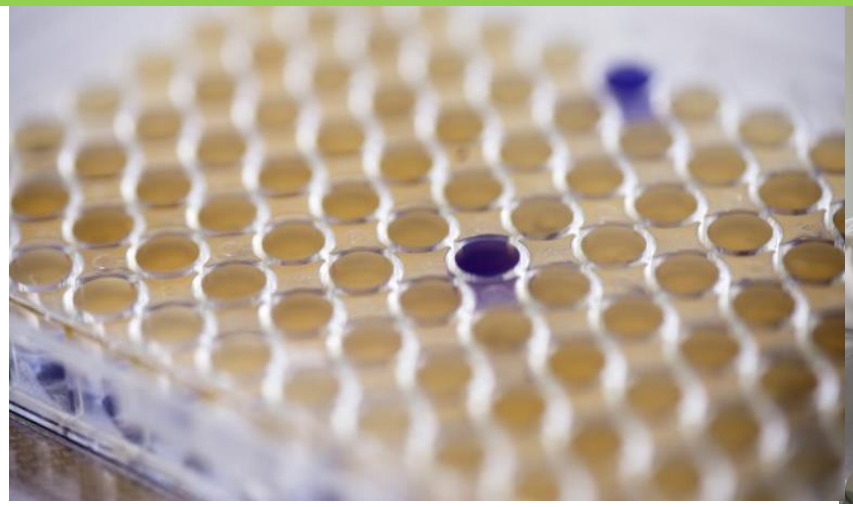
Dairies:

- obligatory inspection of <u>all</u> incoming bulk milk deliveries at dairy
- Backtracking of positive milk batches to the polluter obligatory

Officially recognized labs:

- Interval of testing for milk payment at minimum 4 x/ month/ farmer

Current situation of inhibitor testing in Bavaria



mpr – Milchprüfring Bayern e.V.

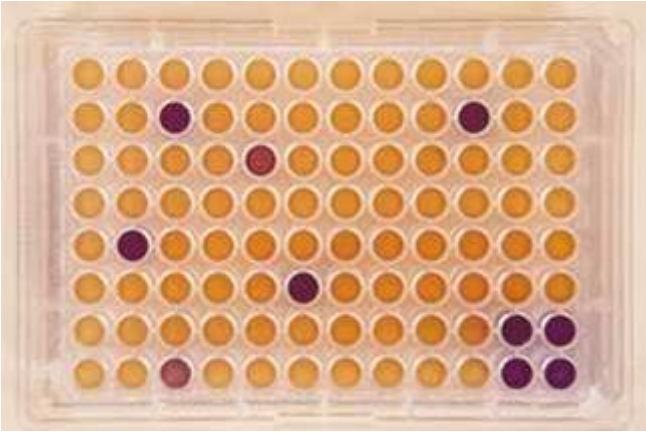
www.mpr-bayern.de

Independent quality and payment testing for Bavaria
~ 33.000 Farmers with ~ 1.240.000 cows

Year 2016
~ 1.800.000 inhibitor tests in the frame of MilchGüV with AiM BRT

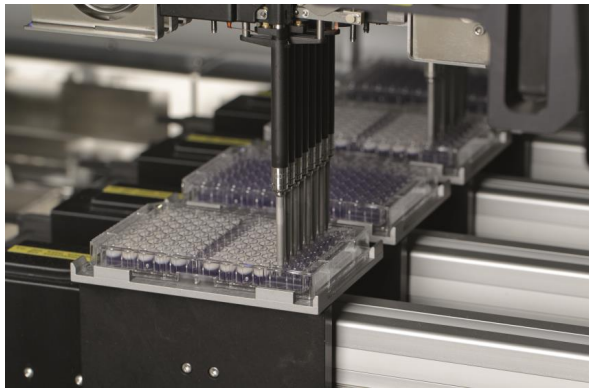
Current situation of inhibitor testing in Bavaria - In the frame of MilchGüV -

- Interval: 4 x/ month (or more, depending on the individual dairy)
- Screening test: BRT Inhibitor Test (AiM)
- Highly sensitive inhibitor screening for interested dairy companies´ milk suppliers: BRT hi-sense
- 1.8 Mio. tests per year
- 0,02 % positive samples



Current situation of inhibitor testing in Bavaria - In the frame of MilchGüV -

- Two-Step system for the screening of raw milk samples:
  - Automated system for the screening of raw milk samples
  - Follow-up examination of positive samples:
    - confirmation with BRT (including sample dilutions), reaction with Penicillinase
    - biosensor MCR-3 / MCR-A
      → Identification (13 antbiotics) and quantification of confirmed positive samples
- ~ 90% Beta Lactams



New Trends in Inhibitor Testing

➢ **Consumer protection priority No. 1!**

Trend 1:

Highly sensitive inhibitor testing

Background

- MRLs valid on single cow level!?
- Highly sensitive testing (below MRL) on bulk milk level necessary?
- Some Dairies: „Zero-Tolerance policy“ (they want no residues at all, at no detectable concentration level)

Highly sensitive inhibitor testing

BRT hi-sense

- Since 2015 in routine use at mpr
- Further development of the BRT Inhibitor Test
- On request of single dairy companies for all their milk suppliers
- Very low test sensitivities, esp. for beta-lactams
- Broad detection of different substance groups at MRL level (at least)

BRT hi-sense

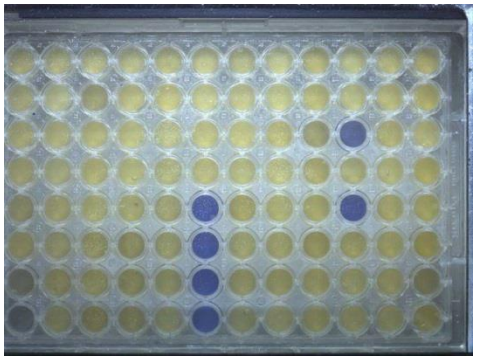
Comparison of detection limits:

BRT Inhibitor Test and BRT hi-sense

		BRT Inhibitor Test	BRT hi-sense
Penicilline	**MRL**		
Amoxicillin	4	2 – 3	1 – 1,5
Ampicillin	4	2 – 3	1 – 1,5
Benzylpenicillin	**4**	**2 – 3**	**0,5 – 1**
Cloxacillin	30	20 – 30	8 – 12
Nafcillin	30	10 – 15	2 – 6
Oxacillin	30	10 – 20	4 – 8
Cephalosporine			
Cefapirin	60	4 – 5	2 – 3
Cefazolin	50	10 – 25	2 – 6
Cefoperazon	50	25 – 50	5 – 10
Cefalexin	100	200 – 300	60 – 80
Cefquinom	20	200 – 400	30 – 50
Ceftiofur	100	100 – 150	20 – 30

		BRT Inhibitor Test	BRT hi-sense
Macrolide			
Erythromycin	40	80 – 100	40 – 80
Tylosin	50	50 – 100	20 – 30
Tetracycline			
Oxytetracyclin	**100**	**200 – 400**	**50 – 100**
Chlortetracyclin	100	400 – 600	100 – 150
Tetracyclin	100	200 – 400	50 – 100
Sulfonamide			
Sulfadiazin	**100**	**200 – 400**	**50 – 100**
Sulfadimethoxin	100	200 – 400	50 – 100
Sulfamethazin	100	300 – 500	100 – 200
Sulfathiazol	100	200 – 400	50 – 100
Aminoglycoside			
DH/Streptomycin	200	600 – 800	150 – 300
Gentamicin	100	50 – 100	20 – 30
Neomycin	1500	300 – 500	50 – 100

BRT hi-sense



Screening trial: BRT Inhibitor Test vs. BRT hi-sense

20.309 raw milk routine samples

Result	BRT Inhibitor Test	BRT hi-sense
Positive	3	19
Penase-unstable	3	7
Penase-stable	0	12

- 7 x more positive samples at start
- Reduced to 2 x positives after 12 months

New Trends in Inhibitor Testing

- **Consumer protection priority No. 1!**

Trend 1:

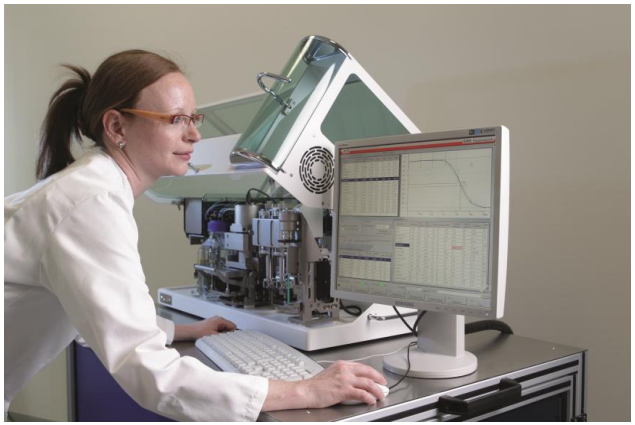
Highly sensitive inhibitor testing

Trend 2:

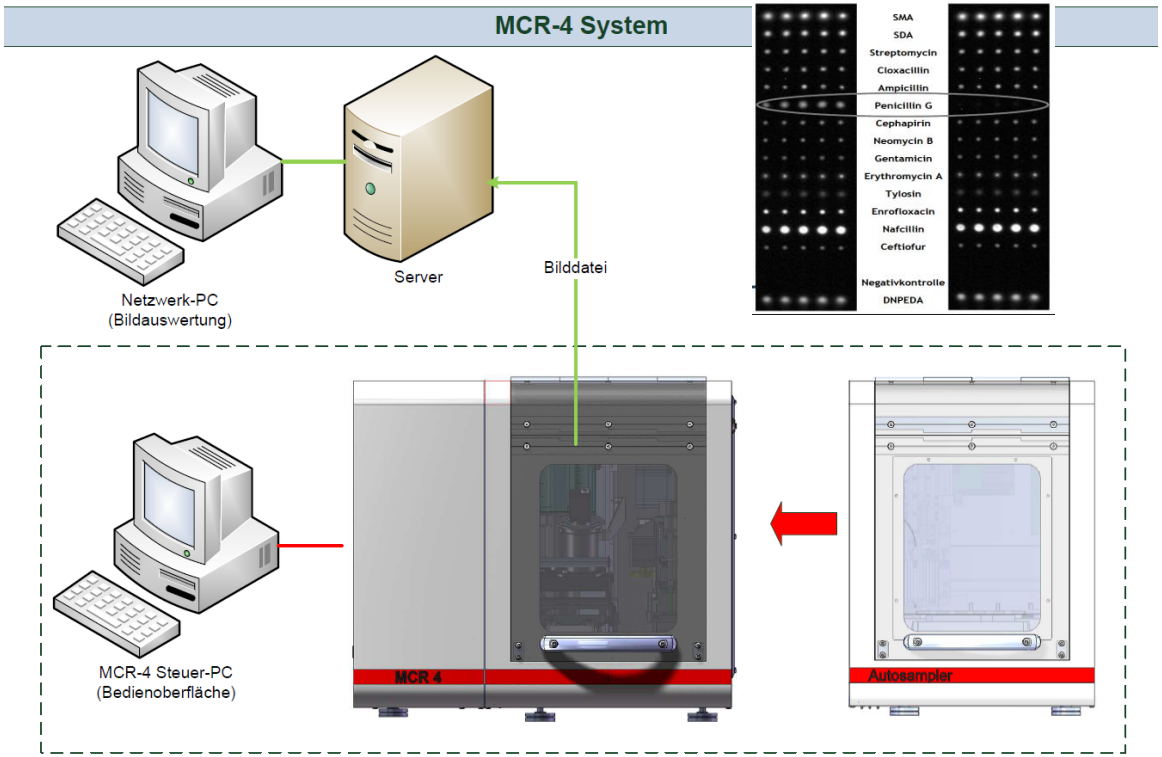
Identification and quantification of positive samples

Current situation of inhibitor testing in Bavaria - In the frame of MilchGüV -

- Two-Step system for the screening of raw milk samples:
  - Automated system for the screening of raw milk samples
  - Follow-up examination of positive samples:
    - confirmation with BRT (including sample dilutions), reaction with Penicillinase
    - **biosensor MCR-3 / MCR-A**
      → Identification (13 antbiotics) and quantification of confirmed positive samples
- ~ 90% Beta Lactams



BioSensor MCR-3 / MCR-A



- Rapid Micro-Array Chip Reader
- Qualification and quantification
- Parallel detection of 13 antibiotics
- Samples: raw milk
- New! Auto Sampler
- Test duration: 8 min

BioSensor MCR-3 / MCR-A

Excerpt from a laboratory report

MCR3-Untersuchung

Untersuchungsdatum: 04.01.2013

Untersuchungsergebnis

Wirkstoff (MRL[5])	[µg/l]	Wirkstoff (MRL[5])	[µg/l]	Wirkstoff (MRL[5])	[µg/l]
Penicillin G (4)	22	Nafcillin (30)	7	Enrofloxacin[4] (100)	---
Ampicillin/Amoxicillin[1] (4)	---	Streptomycin (200)	5	Sulfamethazin (100)	---
Cloxacillin/Oxacillin[2] (30)	---	Neomycin B (1500)	---	Sulfadiazin (100)	---
Cefapirin/Cefquinom[3] (60/20)	---	Gentamicin (100)	---		
Ceftiofur (100)	---	Tylosin (50)	---		

1: amphotere Penicilline, 2: Isoxazolylpenicilline, 3: Aminothiazolyl-Cephalosporine, 4: Chinolon-Antibiotika, 5: nach EU-VO 37/2010

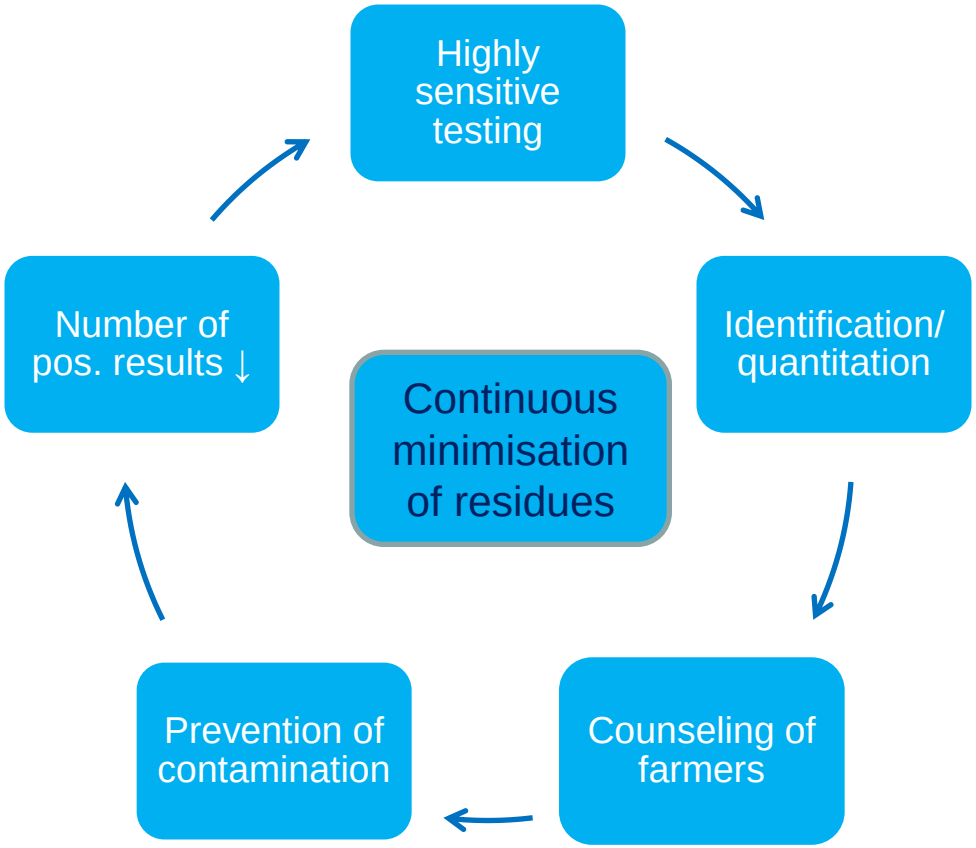
Nafpenzal® T

Dry cow formulation
(Procain-Penicillin + DHS + Nafcillin),
For cattle

Ingredients:
3 g Salbe enthalten: Arzneilich wirksame Bestandteile:
Benzylpenicillin-Procain 1 H2O 297,92 mg
Dihydrostreptomycinsulfat 134,23 mg (entsprechend 100 mg Dihydrostreptomycin)
Nafcillin Natrium 121,95 mg (entsprechend 100 mg Nafcillin)

source: http://www.msd-tiergesundheit.de/products/nafpenzal_t/nafpenzal_t.aspx

Conclusion



Improvement of milk quality/ food safety

& Consumer protection

Thank you for your attention!

www.aimbavaria.com