TC-QS Committee

Report on
INRAP Quality Management System to AFRIMETS TC-QS

By

The National Laboratory of Metrology in chemistry

Date: July, 9th 2019

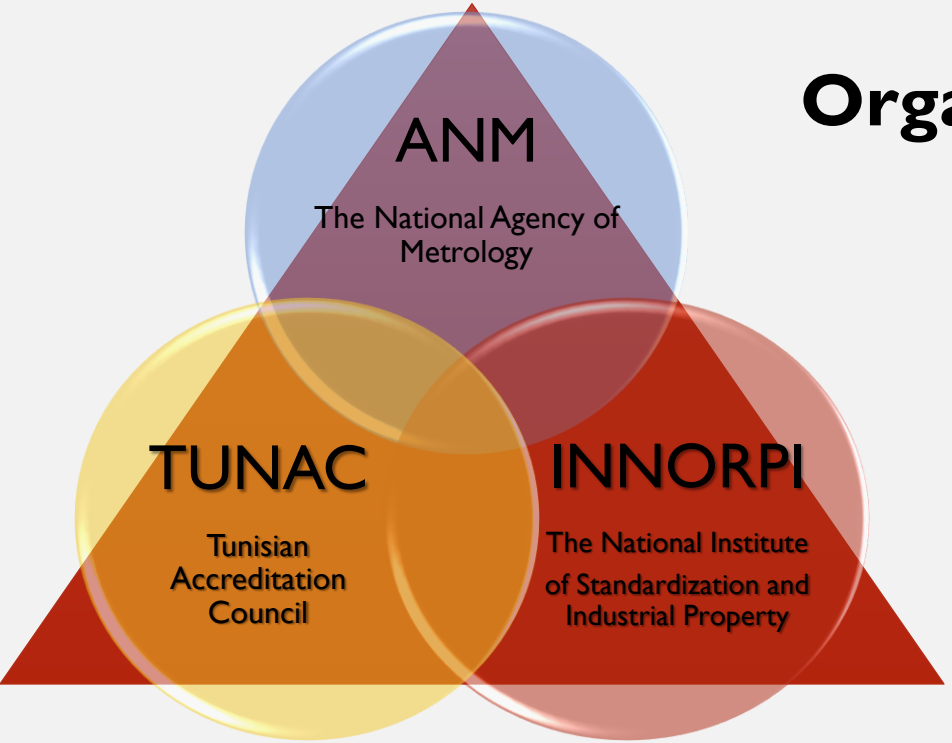
AFRIMETS
Intra-Africa Metrology System
Système Intra-Africain de Métrologie

Agenda

1. Information on the national metrology system
2. Quality policy.
3. Organogram of the NMI.
4. QMS processes and steering mechanisms in the organization.
5. Current accreditations/international recognition.
6. Current status of transition plan to ISO 17025:2017
7. List of updated calibration capabilities covered by the QMS
8. Continuous improvement
9. Audits / external review
10. Addressing weak and strong points
11. Addressing solutions for problems encountered

1. Information on the national metrology system in Tunisia

Organisation of metrology in Tunisia



ANM
The National Agency of Metrology

- Legal Metrology
- Industrial Metrology
- Scientific Metrology

DI: DEFNAT

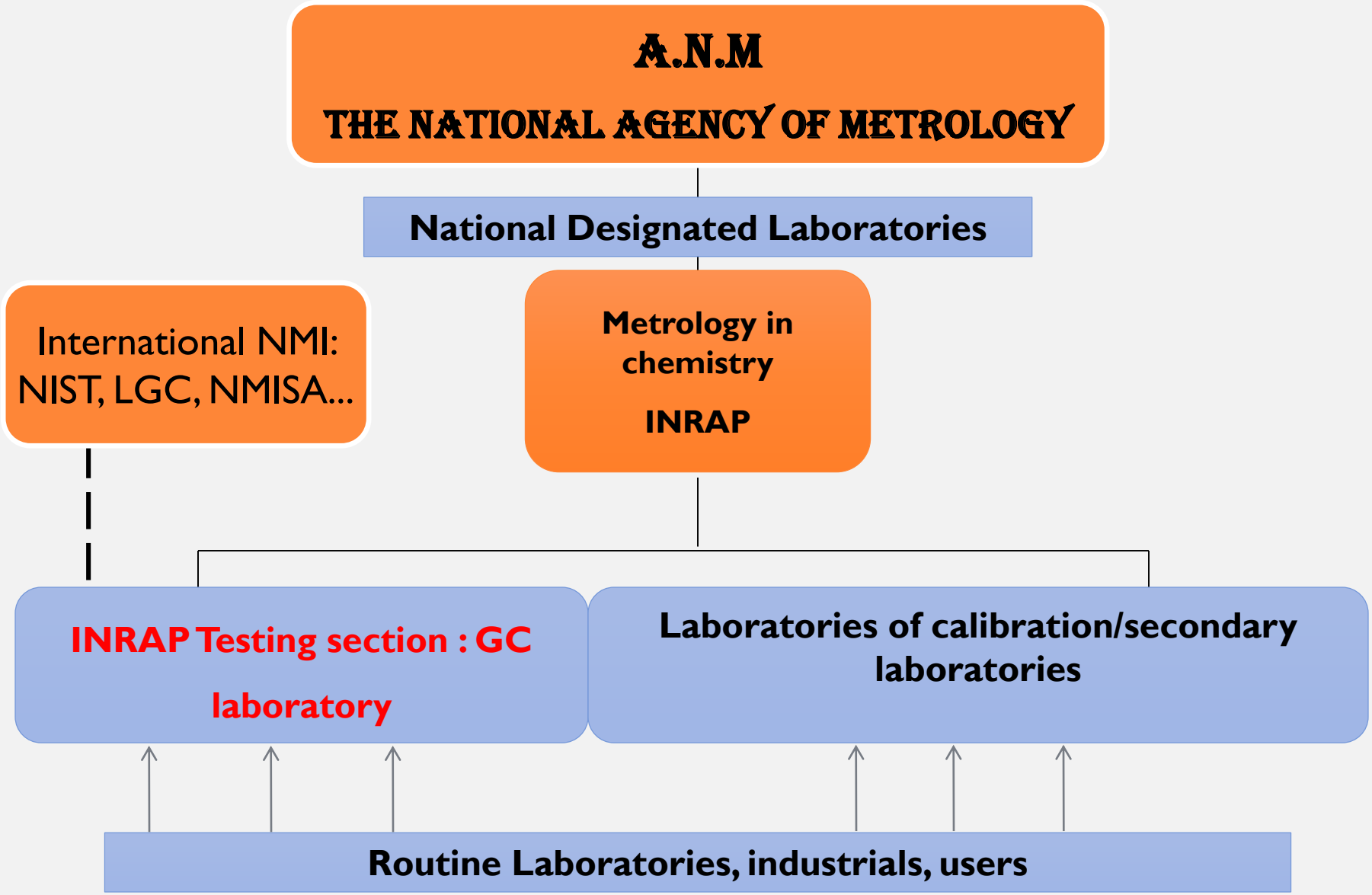
-Time-frequency Metrology

-Electricity-Magnetism Metrology

DI: INRAP

-Metrology in Chemistry

Tunisian metrological traceability chain in chemistry



2. INRAP/LNMc Quality policy

INRAP : QUALITY POLICY

The quality management system of INRAP, according to the ISO/IEC 17025, tends :

- **To support the technical competences of its laboratories for the analysis control and the improvement of the quality of the services supplied to the customers.**

- **To endeavour carrying analysis and providing results that are at a quality level consistent with the international requirements and recognition (TUNAC, EA, ILAC, CIPM).**

Ministère de l'Enseignement Supérieur
& de la Recherche Scientifique
Institut National de Recherche
et d'Analyse Physico-chimique

INRAP

POLITIQUE QUALITÉ

La satisfaction du client constitue pour la **plateforme analytique** de notre Institut un des objectifs stratégiques majeurs de développement. La compréhension pour une meilleure prise en charge des besoins présents et futurs des clients, les exigences de l'ISO/CEI 17025 ainsi que réglementaire et légale nous permet d'adapter nos méthodes et de répondre au mieux aux exigences convenues, nous sommes persuadés qu'une analyse n'a de valeur que si elle est réalisée dans des conditions précises et selon une démarche respectant des règles rigoureuses appliquées à tout laboratoire qui se veut être reconnu.

*L'INRAP, confirmant son engagement pour une qualité de service d'un **niveau international**, s'attache à instaurer, dans toutes ses activités, **un système de management qualité** conforme aux exigences de l'ISO/CEI 17025, les exigences réglementaires et légales ainsi que celles des organisations fournissant la reconnaissance (TUNAC, EA, ILAC) en se fixant comme objectif primordial l'obtention de sa reconnaissance par le biais de l'**accréditation** progressive des analyses qu'il réalise au sein de ses laboratoires.*

Pour ce faire, je m'engage personnellement à apporter tout mon appui ainsi que les ressources humaines et matérielles nécessaires à cette politique.

Je demande à l'ensemble du personnel :

- *de considérer la satisfaction des clients comme priorité majeure ;*
- *de respecter les exigences de la norme ISO 17025, les exigences réglementaires et légales ainsi que celles des organisations fournissant la reconnaissance (TUNAC, EA, ILAC) ;*
- *de s'impliquer dans la démarche qualité afin d'assurer sa réussite et son amélioration continue par l'application de toute la documentation établie dans le cadre du système mis en place ;*

L'INRAP a toujours privilégié le concept de la qualité dans le développement de ses prestations d'analyses et opté pour une recherche permanente d'une conformité totale avec les exigences réglementaires et normatives applicables à ses prestations et à son organisation.

Cette orientation qui nous a valu d'être accrédité, courant 2009, sera d'une part appuyée et d'autre part élargie sur les principes du développement durable basés sur l'efficacité économique, la justice sociale et le respect de l'environnement.

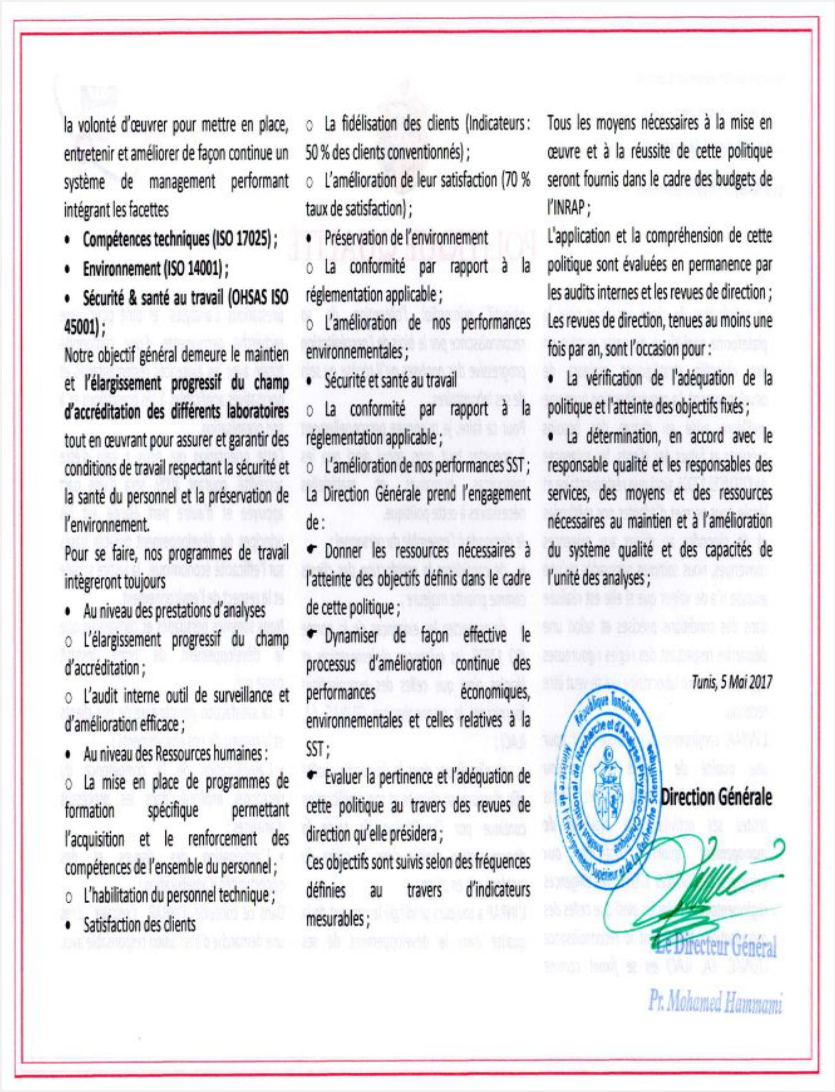
Nous sommes persuadés et convaincus que le développement de notre Institut passe par:

- La satisfaction permanente de nos clients et le respect de nos engagements ;
- L'amélioration de la compétence du personnel impliqué dans les processus d'analyses ;
- L'anticipation des risques et des opportunités d'amélioration ;

Dans ce contexte, l'INRAP s'engage dans une démarche d'institution responsable avec

Our established quality policy applied to all INRAP activities in order to achieve the following objectives:

- **Accreditation of INRAP laboratories according to a program validated annually by the Scientific Council;**
- **Continuous improvement of the competence of the staff involved in the accreditation programs;**
- **Effective participation in proficiency tests;**
- **Customer satisfaction by providing reliable analysis results and control of deadlines;**
- **To participate regularly in key comparisons carried out by the CCQM and RMO which help getting the CIPM Mutual recognition Arrangement demonstrating the international equivalence of our measurement standards and the calibration and measurement certificates issued;**



la volonté d'œuvrer pour mettre en place, entretenir et améliorer de façon continue un système de management performant intégrant les facettes

- **Compétences techniques (ISO 17025) ;**
- **Environnement (ISO 14001) ;**
- **Sécurité & santé au travail (OHSAS ISO 45001) ;**

Notre objectif général demeure le maintien et **l'élargissement progressif du champ d'accréditation des différents laboratoires** tout en œuvrant pour assurer et garantir des conditions de travail respectant la sécurité et la santé du personnel et la préservation de l'environnement.

Pour se faire, nos programmes de travail intègreront toujours

- Au niveau des prestations d'analyses
  - L'élargissement progressif du champ d'accréditation ;
  - L'audit interne outil de surveillance et d'amélioration efficace ;
- Au niveau des Ressources humaines :
  - La mise en place de programmes de formation spécifique permettant l'acquisition et le renforcement des compétences de l'ensemble du personnel ;
  - L'habilitation du personnel technique ;
- Satisfaction des clients
  - La fidélisation des clients (Indicateurs : 50 % des clients conventionnés) ;
  - L'amélioration de leur satisfaction (70 % taux de satisfaction) ;
- Préservation de l'environnement
  - La conformité par rapport à la réglementation applicable ;
  - L'amélioration de nos performances environnementales ;
- Sécurité et santé au travail
  - La conformité par rapport à la réglementation applicable ;
  - L'amélioration de nos performances SST ;

La Direction Générale prend l'engagement de :

- Donner les ressources nécessaires à l'atteinte des objectifs définis dans le cadre de cette politique ;
- Dynamiser de façon effective le processus d'amélioration continue des performances économiques, environnementales et celles relatives à la SST ;
- Evaluer la pertinence et l'adéquation de cette politique au travers des revues de direction qu'elle présidera ;

Ces objectifs sont suivis selon des fréquences définies au travers d'indicateurs mesurables ;

Tous les moyens nécessaires à la mise en œuvre et à la réussite de cette politique seront fournis dans le cadre des budgets de l'INRAP ;

L'application et la compréhension de cette politique sont évaluées en permanence par les audits internes et les revues de direction ;

Les revues de direction, tenues au moins une fois par an, sont l'occasion pour :

- La vérification de l'adéquation de la politique et l'atteinte des objectifs fixés ;
- La détermination, en accord avec le responsable qualité et les responsables des services, des moyens et des ressources nécessaires au maintien et à l'amélioration du système qualité et des capacités de l'unité des analyses ;

Tunis, 5 Mai 2017

Direction Générale

Le Directeur Général

Pr. Mohamed Hammami

3. LNMc Organogram

The LNMc Organogram

Pr Mohamemed HAMMAMI
General Director of INRAP
Fiche Fonction PRH01-F01

Eng. Houyem HAMDI
Head of QM Department
Fiche Fonction PRH01-F01

Eng. Hanen KLICH
Head of LNMc
Fiche Fonction PRH01-F01

Dr Amira ANEN
Head of Analysis Department
Fiche Fonction PRH01-F01

Eng. Wided BELLAZREG
Head Deputy of LNMc

Hanen SALLAMI
Equipment Manager

Soumaya CHAIEB
Head Deputy of LNMc

Organic Chemistry Section

Inoganic Chemistry Section

Electrochemistry Section

GC LAB

Laboratory Manager: **Eng. Haifa BEN KHOUD**
Fiche Fonction PRH01-F01
Laboratory Manager Deputy: **Eng. Wided BELLAZREG**
Quality &Metrology Manager: **Eng. Manel HARAKATI**
Laboratory Technicien : **Nadia Nasaoui**
Laboratory Technicien: **Faten Daly**

LAEI LAB

Laboratory Manager: **Najet CHAABENE**
Fiche Fonction PRH01-F01
Quality & Metrology Manager: **Najet CHAABENE**
Laboratory Technicien: **Bader LOUATI**
Laboratory Technicien: **Wiem AYADI**
Laboratory Technicien: **Mohamed Rabiye BEN CHIKH IBRHIM**

MS LAB

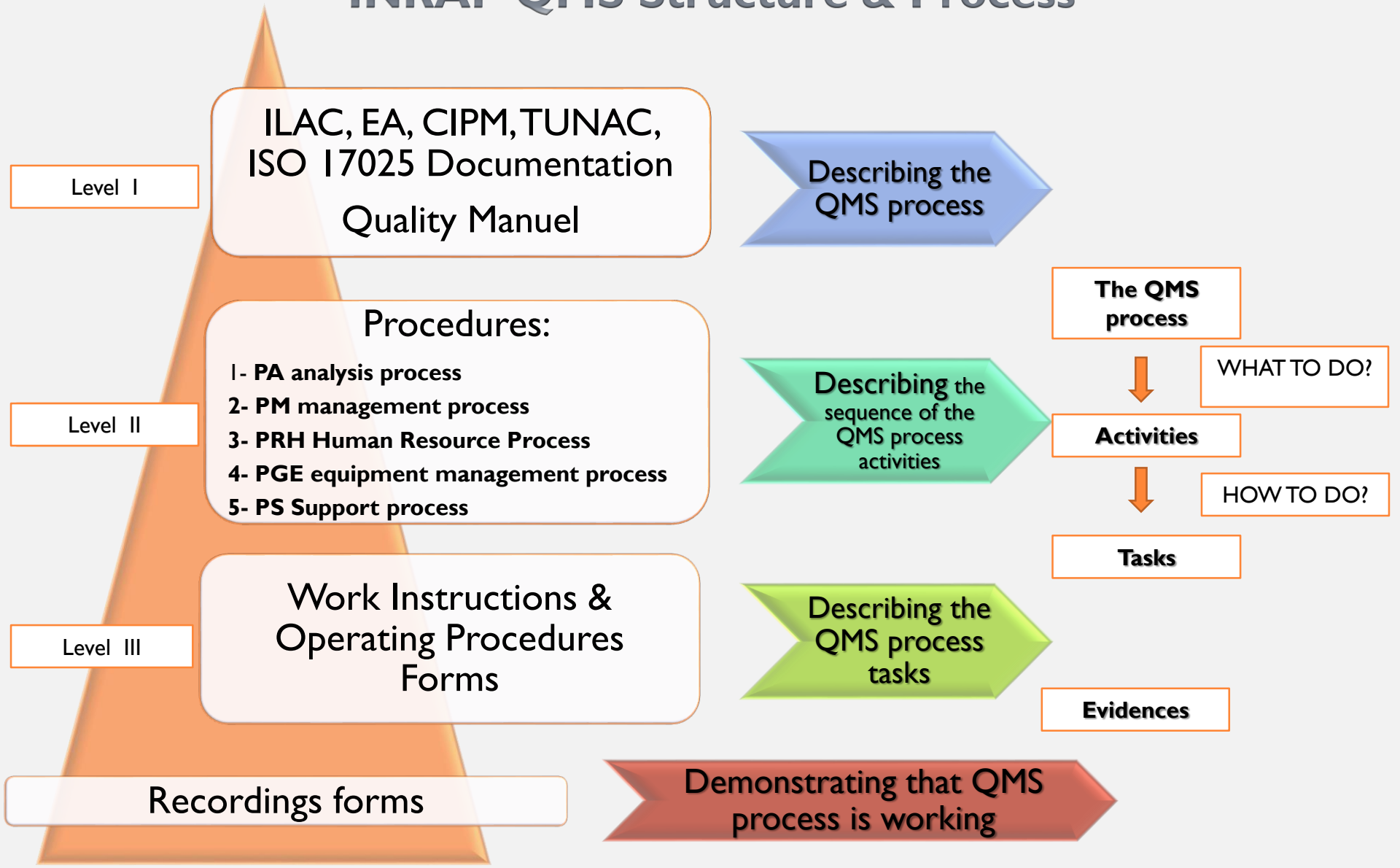
Laboratory Manager: **Eng. Ons KESRAOUI**
Fiche Fonction PRH01-F01
Laboratory Manager Deputy: **Ines BEN AMOR**
Quality &Metrology Manager: **Eng. Semira BEJAOUI**
Laboratory Technicien : **Imen BEN MBAREK**
Laboratory Technicien: **Emna JRIDETTE**

HPLC LAB

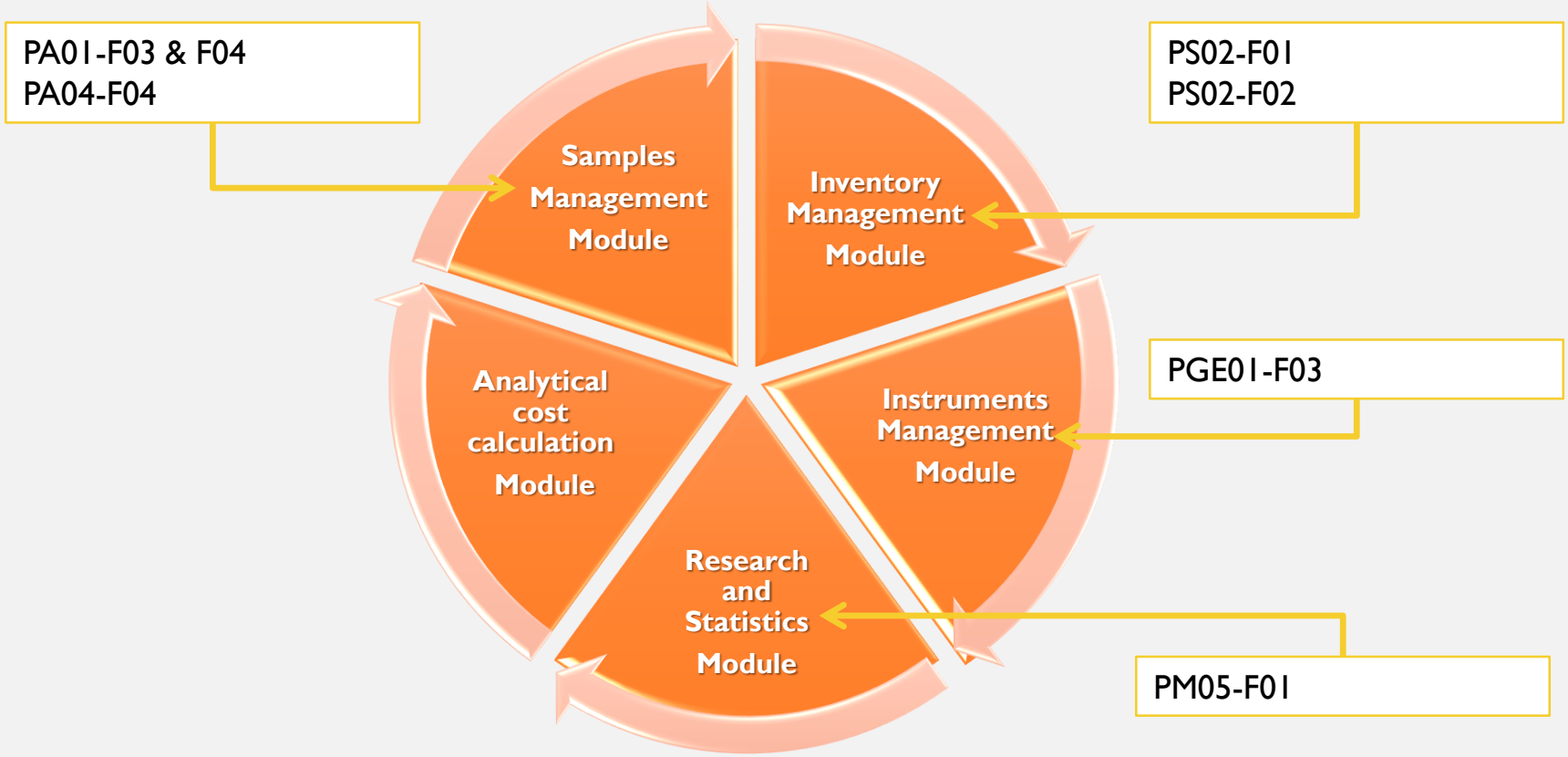
Laboratory Manager: **Eng. Rachel TORKHANI**
Fiche Fonction PRH01-F01
Laboratory Manager Deputy: **MEHDI SAFTA**
Quality &Metrology Manager: **Eng. Abir AIDOUDI**
Laboratory Technicien : **Jamila MIMOUNI**

4. QMS processes and steering mechanisms in the organization

INRAP QMS Structure & Process



The Data Management System: LIMS

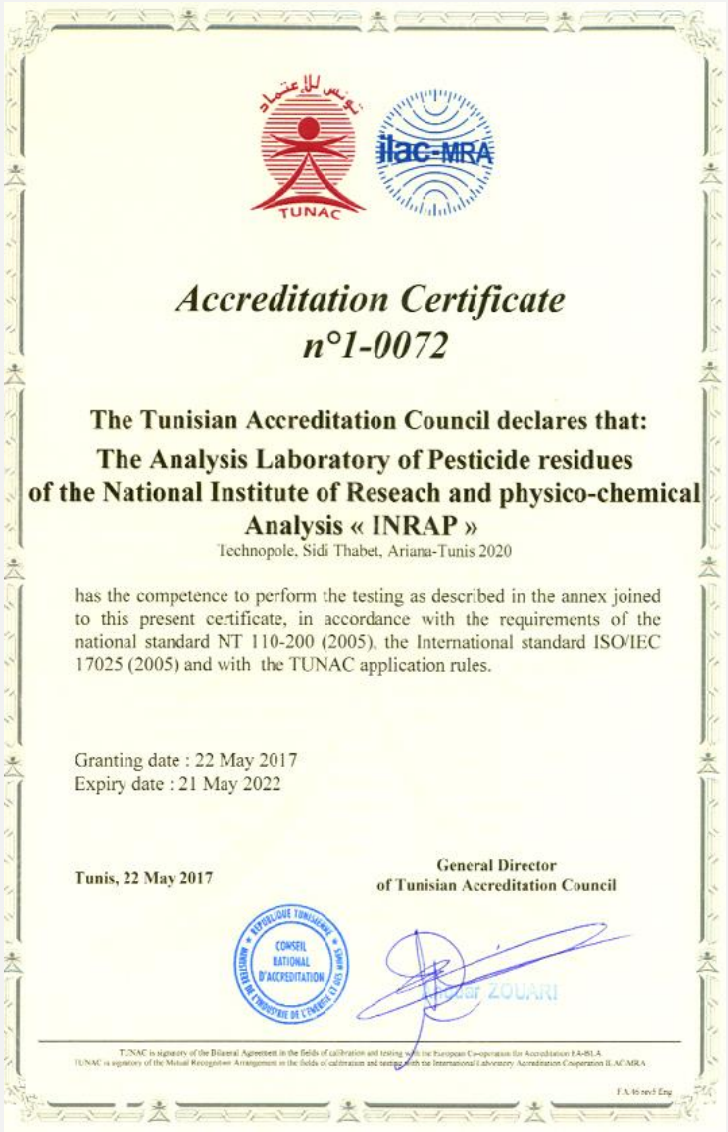


- **Designed according to the ISO/IEC 17025 and safety and traceability FDA, 21 CFR Part 11 standards,**
- **Responds to the requirements : Do what ? When? How? and why ?**

5. Current accreditations/international recognition.

From Accreditation to International equivalence of measurements CIPM-MRA

INRAP obtained its accreditation in 2017 for the analysis of pesticides in matrixes of plant origin by GC-ECD and confirmation by CG-MS,



Accreditation Certificate
n°1-0072

The Tunisian Accreditation Council declares that:

The Analysis Laboratory of Pesticide residues of the National Institute of Reseach and physico-chemical Analysis « INRAP »

Technopole, Sidi Thabet, Ariana-Tunis 2020

has the competence to perform the testing as described in the annex joined to this present certificate, in accordance with the requirements of the national standard NT 110-200 (2005), the International standard ISO/IEC 17025 (2005) and with the TUNAC application rules.

Granting date : 22 May 2017
Expiry date : 21 May 2022

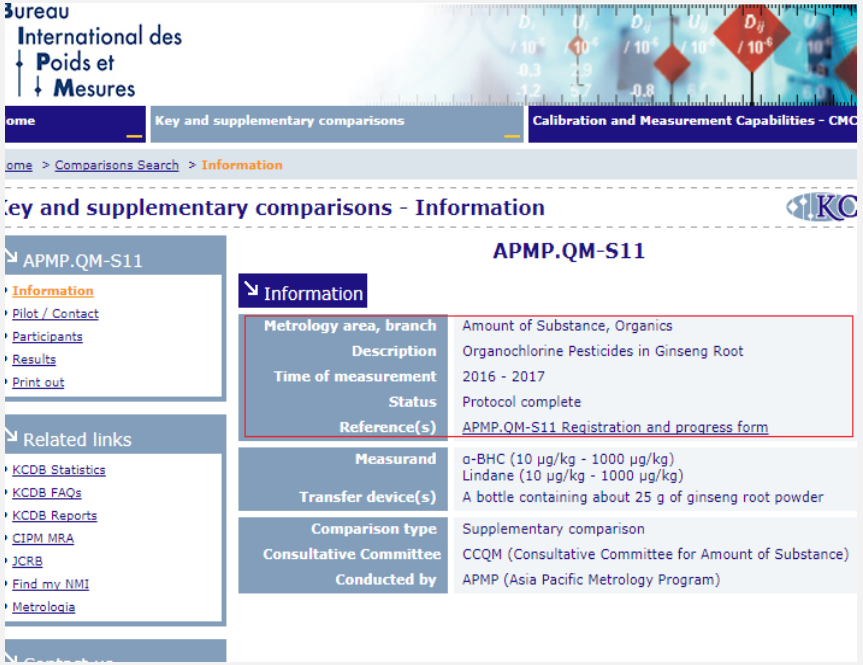
Tunis, 22 May 2017

General Director of Tunisian Accreditation Council

CONSEIL NATIONAL D'ACCREDITATION

Yousef ZOUARI

- Application of CMC in the field of the analysis of pesticide residues by GC - ECD and GCMS/MS confirmation (cycle of January 2019).
- APMP.QM-S11 :APMP Supplementary Comparison Organochlorine Pesticides in Ginseng Roots.
- Results sent: October 2017;
- Application to QS Approval, June 2018;
- INRAP Initial Presentation for QS approval to the AFRIMETS TC-QS in the 12th AFRIMETS GA, July 2018;
- Draft A : Discussion in OWAG Meeting October 2018
- PEER Review by Dr Angélique BOTHA, December 2018;
- QS approval letter sent by the TC-QS chair Dr Noha Khaled on April 2019



6. List of updated calibration capabilities covered by the QMS

Future Project for Accreditation

1. Determination of Antibiotics in food by UPLC-MS-MS by a validated ANSES method.
2. Determination of Heavy Metals in food products by ICP-MS using a validated standardized method.
3. Determination of Mycotoxins in cereals by HPLC-FLD by a standardized method (ISO 16050 standard).

INRAP official list of analysis coverd by the QMS

INRAP Annual Report to the TC-QS AFRIMETS\liste des analyses par équipement.pdf

7. Current status of transition plan to ISO 17025:2017

INRAP is preparing for the next TUNAC surveillance audit to maintain its accreditation according to ISO/CEI 17025:2017 July 2019

Actions taken to ISO 17025:2017 transition:

1. INRAP Staff training on the new edition ISO/CEI 17025:2017 on December 2018
2. SWOT Analysis of the institute with national experts
3. Renewing the Staff engagement for confidentiality and impartiality
4. Evaluation of the pertinence of INRAP procedures and quality policy with respect to the new version of ISO/CEI 17025:2017 leading to total accordance between INRAP quality documentation and the ISO/CEI 17025.
5. Revision of all QMS procedures
6. Digitalization of INRAP QMS documentation as QMS processes with QualiPro Software

A New software for management system for quality management safety and environment

Staff training

December 2018-April 2019

8. Continuous improvement

I. The annual ILCs planning of LNMc

	Registre de Gestion des Comparaisons Interlaboratoires	Code : PGE05-R01 Date d'émission. : 05/01/2015 Date de révision.: Indice. rév. : 01 Page 2 sur 5

Référence de la CIL	Laboratoire concerné	Nature de l'analyse, analyte	Matrice	Résultats
Fapas 04322 Septembre-Novembre 2017	HPLC/code labo 87	Aflatoxines	Cacahuète	Zscores: Aflatoxine B1= 0 Aflatoxine B2= 0.4 Aflatoxine G1= -0.1 Aflatoxine G2= 0.4 Aflatoxine total= 0.2
Fapas 09111 Août-Septembre 2017	GC/code labo 64	Pesticides HCH-G	Farine de blé	z-score=1.3
Fapas 04311 Avril-Mai 2017	HPLC/code labo 34	Aflatoxines	Aliments pour animaux (à base de céréales)	Zscores: Aflatoxine B1= 0.4 Aflatoxine B2= -0.3 Aflatoxine G1= 1.1 Aflatoxine G2= 0.1 Aflatoxine total= 0.4
Fapas 07282 Mars-Mai 2017	LAEI/code labo 48	Contaminants métalliques	Purée de pamplemousse	Zscores: cadmium=0.4 plomb :0.3 fer:0 étain:-5
02337 Novembre Décembre 2017	LSM	Chloramphénicol	Crevettes	z-score=3.7

Référence de la CIL	Laboratoire concerné	Nature de l'analyse, analyte	Matrice	Résultats
APMP.QM. S11	GC	Pesticides organochlorés	plante ginseng	En cours
Fapas 19241 Décembre 2017- Janvier 2018	GC/code labo 50	Résidus de pesticides	purée de raisins	z-score=0.3
FAPAS 07311 Mai –Juillet 2018	LAEI/code labo 66	Contaminants métalliques	Farine de blé	Cd: Z score 0.6 Hg: z score -0.3 Pb: Zscore 15.6
APLAC PT T109 Avril 2018	LAEI	Cadmium	le lait en poudre	En cours
FAPAS 07317 Aout – Octobre 2018/	LAEI/code labo 50	contaminants métalliques	Poisson	z score cadmium = 1,2 z score Mercure = 0.6
FAPAS 19258 Octobre - Novembre 2018	GC/code labo 23	Résidus de pesticides	purée de myrtilles	z score -0.8

GC Laboratory Regularly Participation in Inter-Laboratory Comparisons

➢ The GC laboratory ensures the maintain and the demonstration of capability and competency through the elaboration of chart control of the laboratories results in comparisons according to PGE05 procedure and ISO 13528: 2015 Standard.

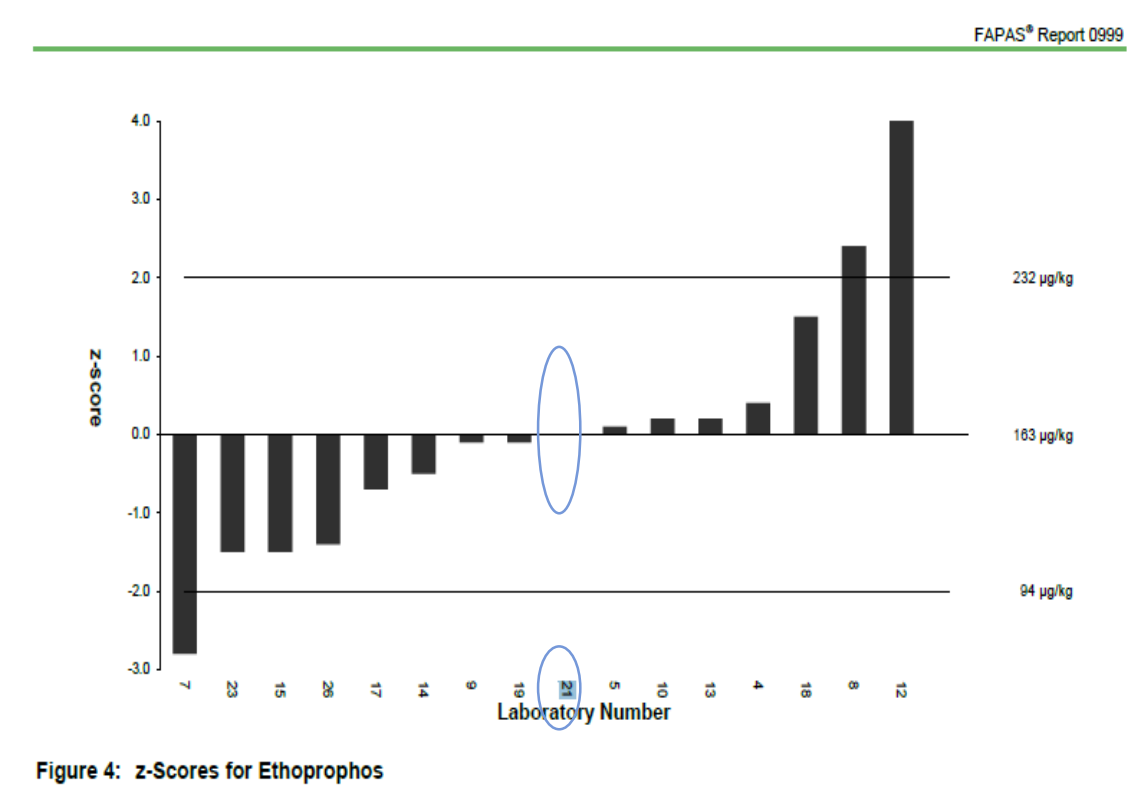


Figure 4: z-Scores for Ethoprophos

II. LNMc Participation in Regional PTs and KC

PTs

- **Participation in APLAC Proficiency Test T102Pesticides Residues in fruit juice coordinated by GHLK- China, December 2016.**

- **Joint Proficiency Testing Program Asia Pacific Metrology Program (APMP) - Asia Pacific Laboratory Accreditation Cooperation (APLAC) "Cadmium in Milk Powder Proficiency Testing Program", coordinated by the National Institute of Metrology - China (NIM), June 2018.**

- **Participation PT with Tubitak-UME in the framework of EURAMET-Empir project to determine heavy metals content in representative food and environmental matrices (fish & water), February 2019.**

- **Participation in PT organized by LPEE/LNM in the framework of MAGMET activity for volume calibration , November 2019.**

KC

- **CCQM.K145 Key comparison entitled « Essential and Toxic elements in bovine liver » organised by The National Institute of Metrology - China (NIM), 2018-2019.**

- **APMP.QM-S10 "Elements in Food Supplement", 2016-2017.**

- **CCQM-K143/P181 copper calibration solutions organized by NIST, 2017.**

- **CCQM-K125 and CCQM-P159: Iodine and other elements in infant formula, 2017**

- **CCQM-K124 Trace Elements and Chromium Speciation in Drinking Water, 2016.**

- **Comparison P174 Aphlatoxin in dryed figue, 2015-2016.**

III. Participation in the CBKT Mycotoxins secondment program at BIPM

Participation of Mrs Rachel TORKHANI in the activity TS4 concerning ”**the preparation of calibration solutions and the attribution of assigned values”**, March 2019.

Year	2016	2017	2018	2019	2020	2021
Study Material at BIPM	AfB1/ZON	AfB1/ZON	AfB1/DON/PAT	DON/PAT	PAT/OTA	OTA
Training material		ZEN		AfB1	DON	
Comparison material			ZEN		AfB1	DON/PAT
NIM (China)	SBS2/SBS3	SBS2/SBS3	SBS2/SBS3	SBS2/SBS3	SBS2/SBS3	
NMISA (South Africa)		TS4+	TS3			
UME (Turkey)		SBS1	SBS3, TS3			
NIMT (Thailand)		TS4			T	
INMETRO (Brazil)		TS4			S	
INTI (Argentina)		TS4	PDS qNMR		TS3	
KEBS (Kenya)		TS4			TS2/TS3	
INRAP (Tunisia)				TS4	?	
LATU (Uruguay)				TS4	SBS2 (MYCO)/TS1/TS3	
CENAM (Mexico)						
INM (Columbia)				TS4	TS1/TS3	
NIES (Egypt)						
RCM-LIPI (Indonesia)					TS3/TS2	
NMLPhil-ITDI (PHL)					TS3/TS4	

Future Plan for qNMR secondement

TS 1: Q-trap on pure mycotoxin
TS 2: LC-UV, LC-CAD and on pure mycotoxin
TS 3: EA, TGA, KF, SB and/or GC-VOCs on pure mycotoxin surrogate
TS 4: Calibration solution preparation and value assignment

SBS 1: qNMR on pure mycotoxin
SBS 2: Q-trap on pure mycotoxin
SBS 3: LC-UV, LC-CAD on pure mycotoxin

Updated Secondment Planning at the BIPM 2016-2019

IV. Training

INRAP conducted in collaboration with:

- **The National Institute of Metrology PTB - Germany**
- **The National Laboratory of Metrology and Tests LNE – France**

Two sessions of the series of General Trainings in Chemical Metrology for the benefit of the National Institutions involved in the National System of Metrology (NMS):

- **INRAP Staff members;**
- **TUNAC;**
- **ANM;**
- **Accredited Laboratories;**

INRAP

LNE
Le progrès, une passion à partager

PTB

الوكالة الوطنية للمترولوجيا
Agence Nationale de Métrologie

1st session : October 19th-22th, 2015	**General training – Metrology in chemistry** ➢The organization of international Metrology, ➢The Missions of a national or designated laboratory, ➢The traceability concept in the Metrology in chemistry.	Dr Sophie VASLIN Dr Béatrice LALERE
2nd Session: January 18th-21th, 2016	**Training in Validation and uncertainties estimation** ➢The process of Validation-Selectivity, ➢ Intermediate precision-Calibration, ➢ Accuracy-limit of quantification, ➢ Accuracy profile, ➢ The concept of uncertainty and the "GUM" use, ➢ The evaluation of measurement uncertainty, The methods supervision.	Dr Paola FISICARO Dr Michelle DESENFANT
3rd Session 2019-2020	**ISO 17034:2016** ➢General requirements for the competence of reference material producers **ISO/IEC 17043:2010** ➢Conformity assessment -- General requirements for proficiency testing	Dr Soraya AMROUCHE

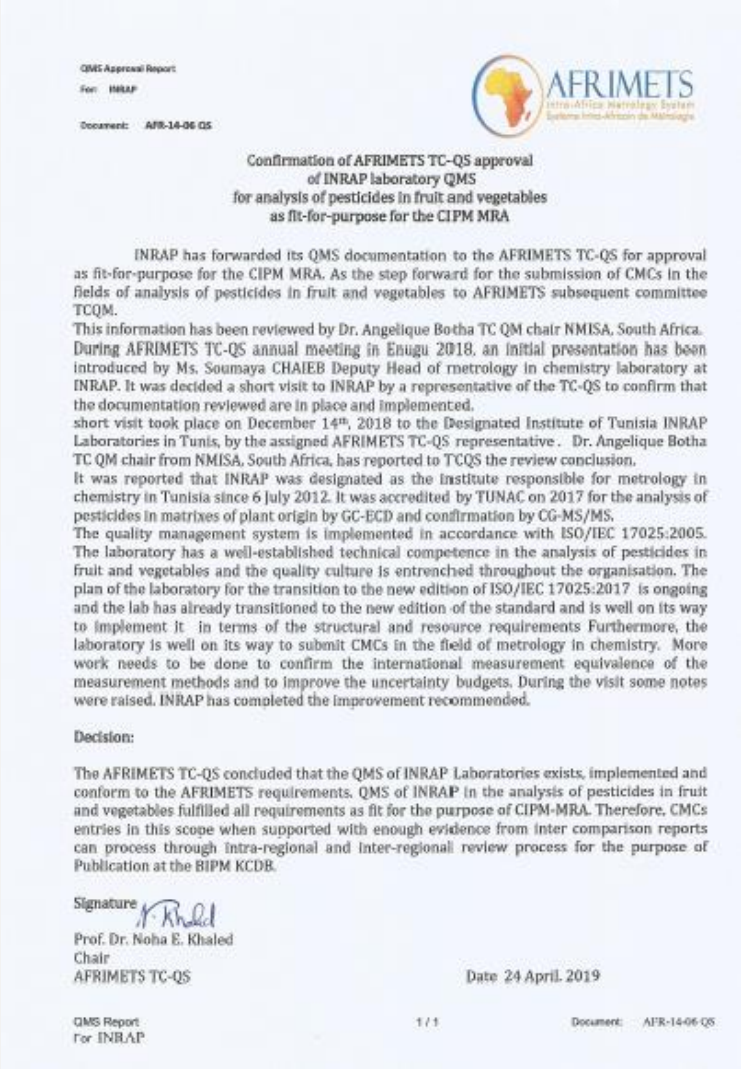
9. Audits / external review

TUNAC survlliance Assessment (3rd Party Assesment)	**Number of nonconformity cards: 6 minors**	**All the nonconformity have been resolved**
Internal Audit	**Number of nonconformity cards: 8 minors**	**All the nonconformity have been resolved**

TC-QS peer review of the quality system of INRAP, December 2018 by Dr Angélique Botha

The peer review revealed that:

1. The quality management system is implemented in accordance with ISO/IEC 17025.
2. The plan of INRAP for the transition to the new edition of ISO/IEC 17025:2017 has already been submitted to TUNAC. In terms of the technical requirements the laboratory has already transitioned to the new edition of the standard and is well on its way to implement the plan for the transition in terms of the structural and resource requirements.
3. INRAP is well on its way to submit CMCs in the field of metrology in chemistry.
4. No non-conformances were raised during the peer-review visit



QMS Approval Report
For: INRAP
Document: AFR-14-06 QS

AFRIMETS

Confirmation of AFRIMETS TC-QS approval of INRAP laboratory QMS for analysis of pesticides in fruit and vegetables as fit-for-purpose for the CIPM MRA

INRAP has forwarded its QMS documentation to the AFRIMETS TC-QS for approval as fit-for-purpose for the CIPM MRA. As the step forward for the submission of CMCs in the fields of analysis of pesticides in fruit and vegetables to AFRIMETS subsequent committee TCQM.
This information has been reviewed by Dr. Angelique Botha TC QM chair NMISA, South Africa.
During AFRIMETS TC-QS annual meeting in Enugu 2018, an initial presentation has been introduced by Ms. Soumaya CHAIEB Deputy Head of metrology in chemistry laboratory at INRAP. It was decided a short visit to INRAP by a representative of the TC-QS to confirm that the documentation reviewed are in place and implemented.
short visit took place on December 14th, 2018 to the Designated Institute of Tunisia INRAP Laboratories in Tunis, by the assigned AFRIMETS TC-QS representative. Dr. Angelique Botha TC QM chair from NMISA, South Africa, has reported to TCQS the review conclusion.
It was reported that INRAP was designated as the institute responsible for metrology in chemistry in Tunisia since 6 July 2012. It was accredited by TUNAC on 2017 for the analysis of pesticides in matrixes of plant origin by GC-ECD and confirmation by CG-MS/MS.
The quality management system is implemented in accordance with ISO/IEC 17025:2005. The laboratory has a well-established technical competence in the analysis of pesticides in fruit and vegetables and the quality culture is entrenched throughout the organisation. The plan of the laboratory for the transition to the new edition of ISO/IEC 17025:2017 is ongoing and the lab has already transitioned to the new edition of the standard and is well on its way to implement it in terms of the structural and resource requirements Furthermore, the laboratory is well on its way to submit CMCs in the field of metrology in chemistry. More work needs to be done to confirm the international measurement equivalence of the measurement methods and to improve the uncertainty budgets. During the visit some notes were raised. INRAP has completed the improvement recommended.

Decision:

The AFRIMETS TC-QS concluded that the QMS of INRAP Laboratories exists, implemented and conform to the AFRIMETS requirements. QMS of INRAP in the analysis of pesticides in fruit and vegetables fulfilled all requirements as fit for the purpose of CIPM-MRA. Therefore, CMCs entries in this scope when supported with enough evidence from inter comparison reports can process through intra-regional and inter-regional review process for the purpose of Publication at the BIPM KCDB.

Signature
Prof. Dr. Noha E. Khaled
Chair
AFRIMETS TC-QS

Date 24 April 2019

QMS Report
For INRAP
1 / 1
Document: AFR-14-06 QS

Recommandation of the expert	INRAP Action
it is recommended that INRAP participate in a ***bilateral comparison*** that could be registered as a ***supplementary comparison for pesticides in fruit and vegetables to confirm their measurement equivalence for the submission of CMC*** claims as soon as possible.	This proposition has been exposed during the last OWAG meeting April 2019. Already in progress with the AFRIMETS TC-QM to organise an AFRIMETS comparaison in coordination with APMP

Action: **Apr 2019.09**	APMP.QM-S11: GLHK to correct the notation of standard uncertainty in the SCRV reported in the study to the bracket notation instead of plus or minus. GLHK to verify the feasibility of a subsequent study. LM to circulate that answer to the group and check for potential participants.

In terms of the continuous improvement of the technical competence of the laboratory it is recommended that the laboratory obtain experience and training in the gravimetric preparation of samples and standards to improve and simplify the uncertainty estimates for its measurement results.	INRAP is already taking action in terms of the recommendation to gain experience in the gravimetric preparation of samples to improve the uncertainty estimates of the measurement results. Several of the scientists from INRAP has signed up for the capacity building and knowledge transfer (CBKT) program of the BIPM to improve their technical skills.

INRAP team with Dr Angélique BOTHA in the GC Lab, December 2019

10. Addressing weak and strong points

INRAP Diagnostic mission related to its organisational development as a DI in Mic

This support mission with :

- **Dr Robert I. WIELGOSZ**

Director of the Chemistry Department; also Head of IT Services
Executive Secretary of the CCQM; Executive Secretary of the JCTLM

- **Dr Wynand Louw**

Director for Research and Technology Development at NMISA
Head AFRIMETS Secretariat
CIPM Committee President

Object of the mission:

- To prioritize the organisational development of LNMc as a DI in Mic

- Diagnose the situation between the INRAP testing section and LNMc

- To establish a new mannegment organisation that will promote for metrology services and satisfying the national needin term of Mic

Outcomes of the mission:

Two levels projects based on a gradual build-up of activities

1. **Project 2020-2021**: Satisfying the national need in metrology services in term of CS and PM based on existing infrastructure with some additional capital investment for:
   - **Implementation a gravimetric unity**
   - **Implementation of ISO 17034:2016**
   - **Establishing a capacity building program with NMISA**

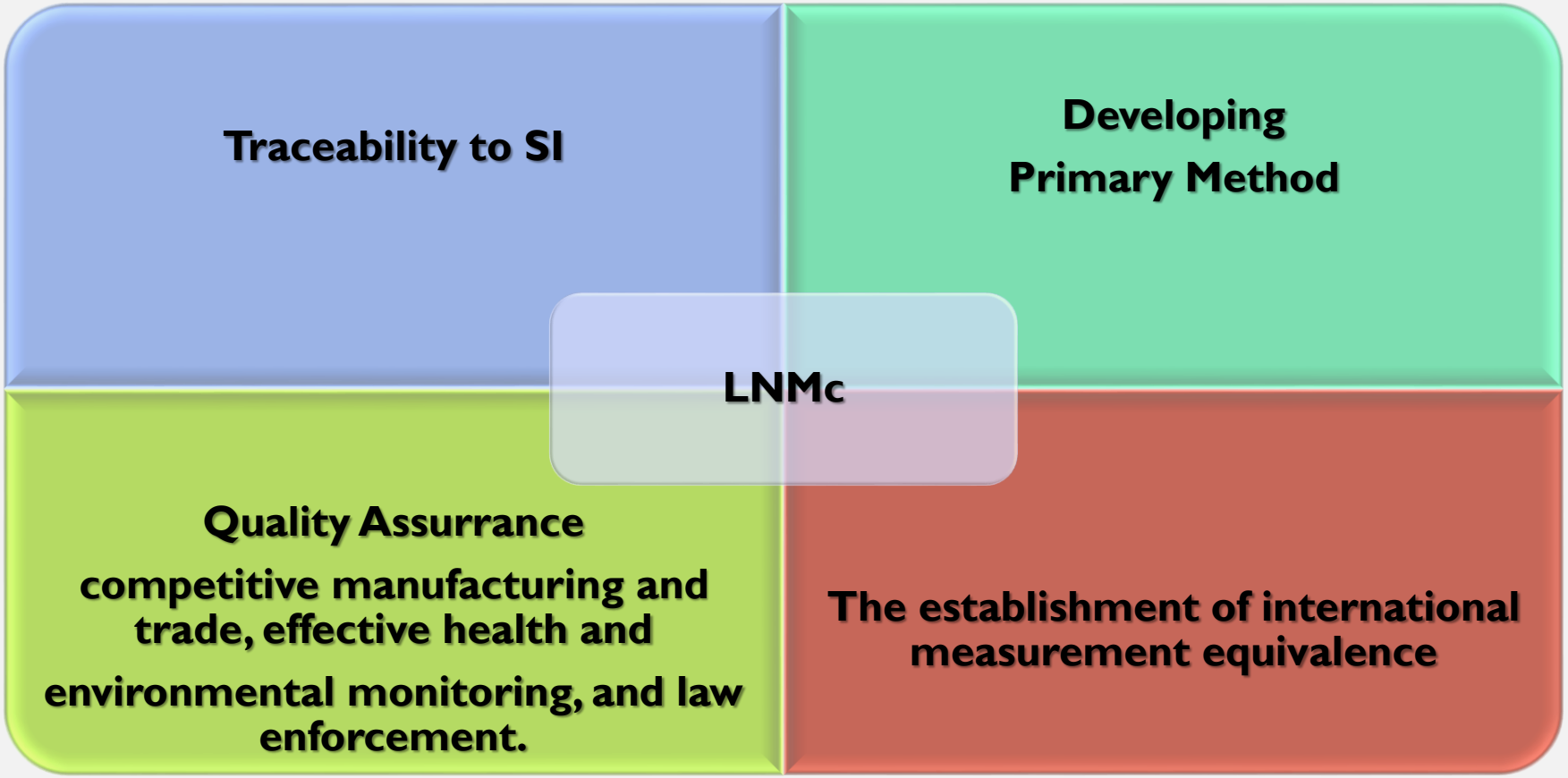
2. **Project 2021-2023**: Establishing measurement services to advance the quality and safety of locally produced products, to produce reference materials for quality of life and to promote good measurement practices and improve the global competitiveness of Tunisia. Via :
   - **Development of Matrix Reference Material production facilities with the increase in staff and funding**

Recommendations for Capital Purchases for INRAP Chemical Metrology Programme

Item N°	Description	Guideline List Price	Justification
1	Balance (10 kg, 0.01 g readability)	3000 €	For production of calibration solutions: weighing of solvents
2	Balance (500 g, 0.1 mg readability)	5000 €	For production of calibration solutions: weighing of solvents/for dilutions
3	Balance (6 g, 0.1 µg readability)	20 000 €	For production of calibration solutions: weighing of powders
4	Balance (2 g, 0.1 µg readability)	20 000 €	For qNMR measurements: standard and sample mass measurements
5	4 marble table for balances	5000 €	Required for each balance
6	Air conditioning system temperature and humidity control with temperature and pressure monitoring for balance room	30 000 €	A metrological quality balance room needs to be established and requires appropriate environmental control, including temperature and humidity control and pressure and temperature monitoring.
7	Anti-static kit	1000 €	Required when weighing small amounts of organic powders
8	Ampouling systems (2)	10000 €	Calibration solutions will need to be stored in ampoules. Flame sealing equipment to be purchased duplicate for redundancy.
9	LC with Charged Aerosol Detection (CAD)	100 000 €	CAD provides a universal detector for LC technique which will be the major instrument used for impurity detection and quantification for related structure impurities, and for stability and homogeneity testing
10	Vacuum Oven	5000 €	For leak testing of ampoules
11	Oven	5000 €	For stability testing of materials and solutions at elevated temperatures
12	+4 °C and -20 °C storage facilities (2 of each)	6000 €	Storage facilities in duplicate at both temperature ranges for pure materials and calibration solutions
13	Karl Fisher Titration with oven transfer system	30 000 €	Determination of water content in pure organic primary
14	UV-VIS spectrophotometer	35 000 €	For homogeneity and stability testing of calibration solutions

INRAP team visit to the gravimetric laboratory at BIPM with Dr Steven Westwood, April 2019

I I. Addressing solutions for problems encountered

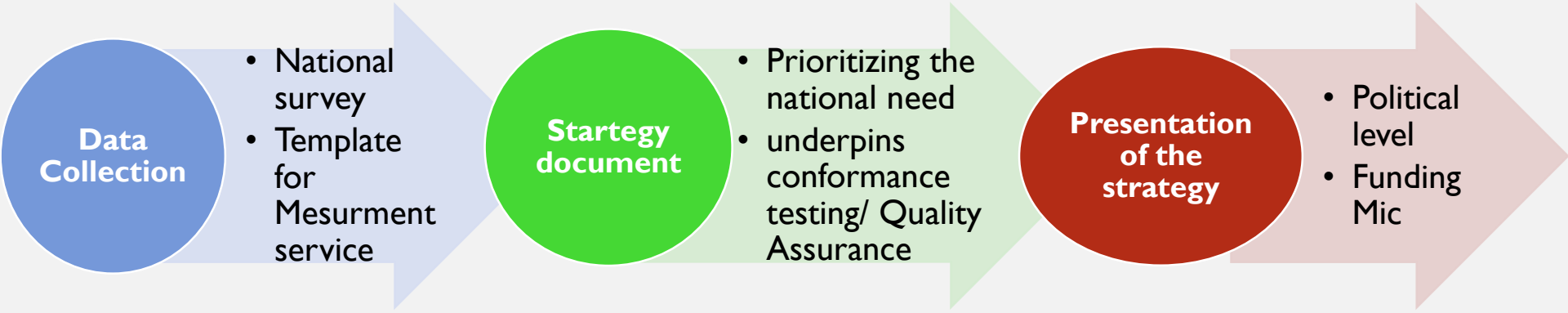


Mission: *"Promote metrology and related activities in Tunisia with the view of facilitating trade at national and international level undergoing conformity assessment process which it gives Tunisian Product a competitive edge."*

Full filling the National need in metrology services in chemistry

A National Strategy in Metrology in Chemistry 2020-2023
LNMc Project I &2

- ✓ **A dynamic leverage of national funding towards Mic in Tunisia goals**
- ✓ **Providing fit for purpose, comparable and internationally accepted national metrology system**
- ✓ **To ensure the safety, health, and consumer and environmental protection of its citizens**



THANK YOU
&
Welcome in Tunisia