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NMISA-PT116

Proficiency Test Description

Toxic and Nutritious Elements in Maize flour

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1 FOREWORD

This is the call for participation in, and description of the NMISA proficiency test (PT) for the determination of selected nutritional and toxic elements in a maize flour material. Participants will be required to report on all parameters which form part of their routine or developing laboratory services. A confidential report will be issued to all participants after completion of the PT. Information on the material, parameters included for potential performance evaluation, as well as dates for the registration, distribution and reporting are listed in **Table 1**.

This forms part of a range of ISO/IEC 17043 accredited PT services offered by NMISA. Please consult our website www.nmisa.org for information on PT schemes on offer. NMISA can also assist with the preparation of traceable gravimetrically prepared spike solutions for benchmarking *ad-hoc* analyses for which commercial PT schemes are not available.

2 SCHEME AIMS

This scheme will assist laboratories that routinely analyse elemental content (nutritional and toxic) in grains (food and feed matrices), to monitor their laboratory performance. The PT allows laboratories to evaluate the accuracy and comparability of their measurement results; the continued competency of analytical staff; the continued improvement of their quality managements system and the effectiveness of the current quality assurance measures within the laboratory. In addition, this information may also be used to provide accreditation bodies or clients with objective evidence of laboratory performance.

3 PARTICIPATION FEES AND ADDITIONAL CHARGES

The cost of participation in the PT scheme is R 4 400. This fee includes the material and a confidential report upon completion, but excludes costs associated with delivery (0% VAT, please note that we are not a VAT registered company). Upon registration for participation an official quotation will be provided. Participation is confirmed following receipt of a purchase order and/ or proof of payment.

Since many of the South African participants are located within close proximity to NMISA, the option of collecting the PT scheme samples from NMISA premises is permitted.

International laboratories will have test samples sent by courier and appropriately packaged to maintain sample integrity. International participants must provide NMISA with any import or quarantine permits that might be required to complete sample delivery well in advance of the shipment date and are liable for any customs or import duties charged.

4 PT DESCRIPTION

The timeline for the PT is presented in **Table 1**. Laboratories are requested to report results for as many of the parameters specified as possible, to allow for maximum benefit from the participation. This study is designed to support laboratories routinely performing elemental analyses in food (e.g., nutritional labelling or determination of toxic elements). The levels of the analytes should be easily achievable using analytical methods typically applied, however, some of the trace elements can be expected to represent a measurement challenge. Instructions for proper handling and storage of the samples prior to sample preparation will accompany the PT samples. Participants should adhere to these instructions to ensure sample integrity and comparability of the results.

Table 1: PT details for NMISA-PT116 Nutritious and Toxic Elements in Maize flour.

NMISA-PT116		Sample format	Distribution/ Dispatch	Result reporting
Parameters	**Toxic and nutritional elements**: Copper (Cu): 0.1 – 50 mg/kg Calcium (Ca): 10 – 500 mg/kg Iron (Fe): 0.1 – 100 mg/kg Lead (Pb): 0.001 – 10 mg/kg Magnesium (Mg): 500 – 2000 mg/kg Manganese (Mn): 0.1 – 100 mg/kg Nickel (Ni): 0.1 – 50 mg/kg Potassium (K): 1000 – 2000 mg/kg Sulphur (S): 500 – 2000 mg/kg Zinc (Zn): 0.1 – 100 mg/kg	1 x 50 g maize flour	Sept 2024	Oct 2024
Result Reporting	Participants will be required to perform the analysis using their normal laboratory procedures and are required to report **two results for each parameter measured in each of the samples provided.** Participants are encouraged to include an uncertainty estimate for each result obtained. The result reporting form will be distributed to participants and will request additional information on the measurement technique and parameters, any recovery correction application, calibration standards used, etc.			
PT conduct	**Assigned value** • The assigned value for the elements with be the reference values obtained through ICP analysis at the NMISA Inorganic Analysis Laboratory. **Laboratory performance** • Laboratory performance will be evaluated using the z-score **Standard deviation of proficiency assessment** • NMISA typically employs the modified Horwitz model to estimate the reproducibility standard deviation that can typically be expected. • The standard deviation of participant results will also be included in the final PT report for reference and the robust standard deviation of participant results may be considered as the standard deviation of proficiency assessment. **PT report** • The PTS report will be distributed within 2 weeks following the result submission deadline. Reports will be provided in electronic format only (Adobe Acrobat- pdf) files. The scheme is fully confidential. Each participant will be issued with a unique identification number. For multiple participants within the same laboratory the participating laboratory is required to identify its analysts by a code known only to the laboratory.			