Provision of Chemical Proficiency Testing Round on Proximate and Mineral Analyses in Milk Powder and Infant Formula

INTRODUCTION

Regular participation in well-organized Proficiency Testing (PT) Round provides an evidence of laboratories’ technical competency and offers quality assurance on the results they are generating. However, participation in PT is very expensive and provided by only few expert laboratories from developed countries.

Remained as the only accredited PT provider in the country since 2013, the Food and Nutrition Research Institute – Proficiency Testing Laboratory (FNRI-PTL) continuously assists the local testing laboratories by providing affordable, accessible and internationally recognized PT programs on nutrition labeling parameters in various food matrices.

The study aimed to evaluate participants’ performance through PT Rounds on proximates (moisture, fat, protein and ash) and minerals (iron, calcium, sodium, potassium and zinc) in milk powder and infant formula.

MATERIALS AND METHODS

1. PREPARATION OF PROFICIENCY TEST ITEMS
2. CONDUCT OF PT (characterization, distribution analysis of PT items and performance evaluation)
3. CONDUCT OF PT SEMINAR AND ISSUANCE OF FINAL PT REPORT
RESULTS

The candidate PT items passed the homogeneity and stability tests for all of the measurands, except for FAT IN MILK POWDER. The inhomogeneity and instability of fat can be attributed to possible high intermediate precision of the measurement method of the subcontractor. Results of homogeneity and stability test showed that the material can be used as PT item.

FAT IN MILK POWDER

CONCLUSIONS

- FNRI-PTL successfully organized two (2) PT Rounds participated in by local testing laboratories.
- The PT Provider established the assigned values and issued performance scores for all the measurands included in both PT Rounds.

RECOMMENDATIONS

- Laboratories that did not obtain “Satisfactory” performance were encouraged to investigate their results and conduct corrective and/or preventive actions.
- FNRI-PTL to regularly organize affordable, accessible and quality PT programs to continuously assist local food testing laboratories.
- FNRI-PTL to further expand its scope of PT Provision to other food matrices and measurands.

RECOMMENDATIONS

- PT SEMINARS were conducted before the provision of PT on Milk Powder to assist the participant laboratories in achieving the objectives of the Round, and after PT on Infant Formula to empower the participants with knowledge and skills to continuously improve their laboratory performance.

CONCLUSIONS

- Results for moisture and ash in MILK POWDER, and protein, ash and sodium in INFANT FORMULA, have $x_p$ with negligible uncertainties, $u(x_p) \leq 0.3\sigma_p$. Thus, PT participants were issued with $z$ scores.
- On the other hand, fat, protein and minerals in MILK POWDER and moisture, fat, iron, calcium, potassium and zinc in INFANT FORMULA, have results that are widely variable, $u(x_p) > 0.3\sigma_p$. Thus, PT participants were issued with $z'$ scores and assigned values must be used with caution.

Majority of the participants obtained “Satisfactory” performance for both PT Rounds, except for FAT IN MILK POWDER. This is attributed to incomplete hydrolysis or fat extraction and/or overflowing of sample during analysis since most of the laboratories reported low values.

Figure 1. Percentage of PT Participant Laboratories with “Satisfactory” Performance

(Note: Assigned values for the measurands (g/100g for proximates and mg/100g for minerals) are presented inside each bar)