Introduction: To test the applicability, to North African children, of previously published reference equations for fat-free mass (FFM), and the need to establish a more reliable reference equation for FFM. Materials and Methods: Anthropometric data (gender, age, weight and height) were used as variables for 1000 healthy Tunisian children aged 8-16 years-old via bioelectrical impedance analysis. Results: The published reference equations did not reliably predict measured FFM. The reference equation was expressed as follow: FFM (kg) = 0.4706 × body weight (kg) + 0.2161 × height (cm) - 2.4659 × gender (boys: 0; girls: 1) + 0.2167 × age (years) - 19.4452. A measured FFM is considered abnormal when it is beyond the limit of normal range (reference value ± 5.5 kg). The anthropometric data explained 86.9% of the FFM variance. Discussion: This FFM reliable reference equation enriches the World Bank of reference equations, and provides useful references for the care of paediatric patients.

Keywords
Body fat distribution, child, body composition, anthropometry.