

MINIMUM COUNTING TIME CALCULATION

The lower limit of detection (LLD) for which the risks of false negative results and of false positive results are each 5% is defined as follows:

$$\text{LLD} = 4.66(\text{SD}_b)/\text{Eff}$$

Where:

$$\text{LLD} = \text{disintegrations in sample in time } T = \text{VL} \times \text{Vol} \times T$$

4.66 = the product of the distribution parameters needed to establish the 5% error limits

SD_b = standard deviation of the background (distilled water) count

$$= N_B^{0.5} = (R_b \times T)^{0.5}$$

N_b = total background counts in time T

R_b = background count rate, in cpm

Eff = detection efficiency, in counts/dis
(a nominal efficiency may be used for screening assays, whereas it should be determined experimentally for verification assays)

VL = verification level for elapsed interval since last bioassay, in dpm/ml

Vol = volume of urine in sample, in ml

T = minimum counting time required, in minutes

$$= R_b(4.66/\text{VL} \times \text{Vol} \times \text{Eff})^2$$