

# TECHNICAL BULLETIN

## A Comparison of Laboratory Detection Limits Versus European Union Action Levels for PCDD/PCDF In Human Food Matrices

### Method Overview

USEPA Method 1613B is applicable to the determination and quantitative measurement of Polychlorinated Dibenzo-p-dioxin (PCDD) and Polychlorinated Dibenzofuran (PCDF) at ultra low detection limits in a variety of matrices. The method provides for the analysis of appropriately prepared, purified sample extracts by high-resolution gas chromatography mass spectrometry (HRGCMS), typically yielding results in the sub parts per trillion level in food samples. Method 1613B is the method of choice to demonstrate compliance with the Directives set forth by the European Union, regulating PCDD/PCDF in a variety of human food products.

### Method Detection Limits

Pace Analytical's detection limits are determined by multiple tests performed on a range of matrices within each product group. A typical matrix is customarily selected for more in-depth statistical analysis to insure the veracity of the limit of detection. Actual detection limits achieved will vary according to the characteristics of the individual sample matrix, and could be slightly higher or lower than those indicated below. To be valid, however, the procedure and results must meet the stringent quality assurance requirements of the method. To achieve best possible detection limits, please supply the laboratory with the estimated sample sizes listed below, considering the actual lipid content of your sample:

<u>Food Product</u>	<u>Typical % Fat</u>	<u>Extract Weight</u>	<u>European Union Action Levels</u>	<u>Laboratory Detection Limit*</u>	<u>Estimated Sample Size</u>
Meat, Ruminants	10	20 g	2.0 pg/g	0.24 pg/g	1 kg
Meat, Poultry	5	28 g	1.5 pg/g	0.18 pg/g	1 kg
Meat, Pig	10	35 g	0.6 pg/g	0.19 pg/g	1 kg
Meat, Liver	2	10 g	4.0 pg/g	0.18 pg/g	1 kg
Fish, Muscle	10	15 g	3.0 pg/g	0.37 pg/g	1 kg
Milk	1-4	20 g	2.0 pg/g	0.15 pg/g	2 L
Milk Products	10-90	20 g	2.0 pg/g	0.15 pg/g	1 kg
Eggs, Egg Products	10-50	20 g	2.0 pg/g	0.28 pg/g	50-500 g
Oils & Fats, Ruminants	50-100	20 g	2.0 pg/g	0.29 pg/g	200 g
Oils & Fats, Poultry	50-100	28 g	1.5 pg/g	0.09 pg/g	200 g
Oils & Fats, Pigs	50-100	35 g	0.6 pg/g	0.15 pg/g	200 g
Oils & Fats, Mixed	50-100	28 g	1.5 pg/g	0.27 pg/g	200 g
Vegetable Oil	90-100	40 g	0.5 pg/g	0.05 pg/g	200 g
Fish Oil	90-100	28 g	1.5 pg/g	0.19 pg/g	100 g
Fruits	NA	100 g	0.4 pg/g	0.02 pg/g	200 g
Vegetables	NA	100 g	0.4 pg/g	0.02 pg/g	200 g
Cereals	NA	100 g	0.4 pg/g	0.03 pg/g	200 g

\*These action levels and detection limits are expressed as pg/g fat WHO TEQ and are reported at three separate levels, as stipulated by the European Union directive dated 3/4/2002, and described below. Laboratory detection limits are based on the upper bound reporting criteria with non-detects calculated at 100% of the level of detection.

Upper Bound – Non-detects calculated at 100% of the level of detection.

Medium Bound – Non-detects calculated at 50% of the level of detection.

Lower Bound – Non-detects calculated as having a value of zero.

The Pace Analytical Dioxin Laboratory is certified to ISO17025 standards as stipulated, to perform work that meets the requirements of the European Union.