

**Distribution of [¹⁴C]Choline Derived Radioactivity 24 Hours Following Oral Administration
of 160 mg/kg [¹⁴C]Choline to Male Wistar Han Rats
Pretreated with 500 mg/kg DMAE (Choline Study C)^a**

Dose Recovered in Excreta (%)

| End of Collection Period (h) | Urine CPDE ^b | Feces CPDE | Volatile Organics ^c CPDE | CO ₂ ^c CPDE | Total CPDE |
|------------------------------|-------------------------|---------------|-------------------------------------|-----------------------------------|-----------------|
| 1 | d | e | 0.0027 ± 0.0009 | 0.0827 ± 0.0067 | 0.0854 ± 0.0072 |
| 2 | d | e | 0.0133 ± 0.0063 | 0.294 ± 0.031 | 0.307 ± 0.034 |
| 3 | d | e | 0.0225 ± 0.0041 | 0.658 ± 0.085 | 0.681 ± 0.089 |
| 4 | 1.22 ± 0.53 | e | 0.0358 ± 0.0027 | 1.19 ± 0.17 | 2.45 ± 0.58 |
| 6 | d | e | 0.0496 ± 0.0044 | 2.71 ± 0.70 | 3.98 ± 0.97 |
| 8 | 5.37 ± 1.91 | 0.291 ± 0.257 | 0.0540 ± 0.0045 | 4.68 ± 1.16 | 10.4 ± 3.1 |
| 24 ^f | 40.7 ± 6.3 | 11.2 ± 8.4 | 0.0651 ± 0.0019 | 15.1 ± 4.0 | 67.1 ± 2.3 |

Distribution in Tissues (24 hours)

| Tissue | nmol-eq Choline/g Mean | nmol-eq Choline/g SD | TBR ^k Mean | TBR SD | Dose in Total Tissue (%) Mean | Dose in Total Tissue (%) SD |
|------------------------------|------------------------|----------------------|-----------------------|--------|-------------------------------|-----------------------------|
| Adipose ^g | 84.4 | 23.0 | 0.327 | 0.082 | 0.482 | 0.159 |
| Urinary Bladder | 344 | 60 | 1.41 | 0.59 | 0.0270 | 0.0212 |
| Blood ^g | 265 | 73 | Unity | — | 1.58 | 0.46 |
| Brain | 109 | 26 | 0.415 | 0.030 | 0.0636 | 0.0132 |
| Heart | 306 | 52 | 1.18 | 0.14 | 0.0835 | 0.0147 |
| Kidney | 937 | 160 | 3.62 | 0.46 | 0.550 | 0.090 |
| Liver | 2049 | 578 | 7.73 | 0.20 | 5.59 | 1.86 |
| Lung | 574 | 128 | 2.19 | 0.14 | 0.218 | 0.043 |
| Muscle ^g | 125 | 2 | 0.498 | 0.151 | 4.06 | 0.24 |
| Skin ^g | 273 | 28 | 1.07 | 0.23 | 4.18 | 0.31 |
| Spleen | 540 | 60 | 2.11 | 0.39 | 0.101 | 0.027 |
| Thyroid | 592 | 119 | 2.28 | 0.27 | 0.0028 | 0.0002 |
| Testes | 190 | 18 | 0.746 | 0.159 | 0.187 | 0.028 |
| Stomach ^h | NA ⁱ | — | NA | — | 0.371 | 0.115 |
| Small Intestine ^h | NA | — | NA | — | 1.86 | 0.62 |
| Cecum ^h | NA | — | NA | — | 0.330 | 0.047 |
| Large Intestine ^h | NA | — | NA | — | 0.313 | 0.115 |
| Carcass ^j | NA | — | NA | — | 0.00 | 0.00 |

Disposition Summary [Dose Recovered (%)]

| Tissues and GI Tract | Excreted | Total |
|----------------------|------------|------------|
| 20.0 ± 3.8 | 67.1 ± 2.3 | 87.1 ± 1.9 |

^aAll values expressed as mean ± standard deviation (SD) (N = 3). The target dose was 160 mg choline/kg. The actual dose delivered was 162 ± 4 mg/kg (43.0 ± 1.1 µCi/kg). Animals received a single oral dose of DMAE (target 500 mg DMAE/kg) approximately 1 hour (h) prior to [¹⁴C]choline administration. The actual DMAE dose delivered was 508 ± 17 mg/kg.

^bCPDE = Cumulative percent dose excreted.

^cVolatile organics (trapped by isopropanol) and CO₂ (trapped by 1 N NaOH in H₂O) in exhaled breath.

^dUrine was collected at 4, 8, and 24 h after [¹⁴C]choline administration.

^eFeces were collected at 8 and 24 h after [¹⁴C]choline administration.

^f24 h urine collection includes urine present in the urinary bladder at study termination.

^gPercent of dose in these tissues calculated using the following percentages of body weight: adipose 7.0%, blood 7.4%, muscle 40.4%, and skin 19.0%.

^hIncludes contents.

ⁱNA = Not applicable.

^jCarcass values are based on the residual digested carcass after the removal of the listed tissues (i.e., percent dose measured in skin, adipose, blood, and muscle was subtracted from the total percent dose measured in the carcass).

^kTBR = Tissue to blood ratio.