

## Naturally Occurring Ah-Receptor Agonists in Foods: Implications Regarding Dietary Dioxin Exposure and Health Risk

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### ABSTRACT

The human diet contains numerous naturally-occurring compounds that are aryl hydrocarbon receptor (AhR) agonists. This analysis compares the dietary TCDD-equivalent (TEQ) dose from specific vegetable indoles vs. the AhR-active PCDD/Fs. Daily dietary doses of indole-3-carbinole (I3C) and its condensation product indolo [3,2-*b*]carbazole (ICZ) were derived from the published literature. Relative estimate of potency (REP) values were developed for I3C ( $8.7 \times 10^{-3}$ ) and ICZ (0.5). The TEQ doses of I3C and ICZ together comprised >99% of the total daily TEQ dose; the daily ICZ TEQ dose ( $1.4 \times 10^6$  pg TEQ/day) was approximately 45,000-fold greater than the current dietary PCDD/F TEQ dose (32 pg TEQ/day). When 30-year accumulated body burden and area-under-the curve doses were calculated, I3C/ICZ still comprised a significant fraction (up to 95 and 96%, respectively) of the total TEQ dose. Further, reduction or elimination of meat and dairy products yielded a minimal (less than 4%) decrease in total TEQ dose. These findings indicate that reducing the intake of animal products (the primary source of dietary PCDD/Fs) might not achieve a significant reduction in total “dietary dioxin TEQ” dose; the comparisons also suggest that trace levels of PCDD/Fs in the human diet are unlikely to pose a significant health risk.

**Key Words:** indoles, dioxins, relative potencies, dietary intakes, risk assessment.