Title: Assessment of the Potential Human Exposure to Heterocyclic Amines from Cooked Meat Products – NPB #08-176

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Date Submitted: September 29, 2009

SCIENTIFIC ABSTRACT

The main objectives of this study are to review of the major categories of fresh and processed meat products that are candidates for heterocyclic amine (HCA) formation and develop a matrix of levels of HCA among the major consumed meat categories (based on data in the published literature); and to conduct an exposure assessment based on known dietary consumption patterns. The project was comprised of three parts, including: 1) a literature review and data compilation, 2) a consumer behavior/preference survey, and 3) a dietary exposure assessment. In phase 1, data on HCA formation based on different methods of cooking/processing were reviewed and compiled. In phase 2, an internet survey was conducted to ascertain the prevalence of various meat cooking methods that are preferred among US meat consumers. In phase 3 of the study, data from phases 1 and 2 were combined with food consumption data from the National Health and Nutrition Examination Survey 2003-2006 (NHANES 03-06), to derive estimates of exposure to HAs from meat consumption.

Based on the available published data, Exponent created an Excel database of HCA and B[a]P levels for 83 types of meat cuts by cooking method and degree of doneness that were included in the consumer behavior/preference survey. Based on NHANES 2003-2006 consumption data and the consumers’ behavior/preference internet survey, food intake estimates for the 83 meat cuts by methods of cooking and degree of doneness were tabulated and summarized. Uncertainties associated with the dietary exposure estimates, particularly those associated with the existing data gaps in HCA levels in foods are also described. Overall, the existing data gaps and the extrapolation/surrogating from the available HCA level data present significant uncertainty in the exposure estimates and thus these results should be carefully interpreted. If it is possible in the future to fill the HCA data gaps (described in this report), then it would be recommended to re-estimate HCA exposure based on these improved data.