

TABLE 2.—SUMMARY OF TOXICOLOGICAL DOSE AND ENDPOINTS FOR CLOTHIANIDIN FOR USE IN HUMAN RISK ASSESSMENT—Continued

| Exposure Scenario | Dose Used in Risk Assessment, UF ¹ | Special FQPA SF ² and LOC for Risk Assessment | Study and Toxicological Effects |
|-----------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chronic Dietary (All populations) | Offspring NOAEL= 9.8 UF = 1000 ¹ Chronic RfD = 0.0098 mg/kg/day | FQPA SF = 1 cPAD = chronic RfD ÷ FQPA SF = 0.0098 mg/kg/day | 2-Generation Reproduction Study Offspring LOAEL = 31.2 mg/kg/day based on decreased mean bwt gain and delayed sexual maturation, decreased absolute thymus weights in F1 pups and an increase in stillbirths in both generations |
| Cancer (oral, dermal, inhalation) | Classification: Not likely | | |

¹ An additional 10X database uncertainty factor for lack of a developmental immunotoxicity study.

² The reference to the FQPA SF refers to any additional SF retained due to concerns unique to the FQPA.

C. Exposure Assessment

1. *Dietary exposure from food and feed uses.* Currently there are no tolerances established for clothianidin alone on any commodity. However, clothianidin is a major metabolite of thiamethoxam, and tolerances for the combined residues of thiamethoxam and its metabolite clothianidin have been established under 40 CFR part 180.565 for both plant and livestock commodities. Tolerances for thiamethoxam range from 0.02 ppm to 1.5 ppm. Risk assessments were conducted by EPA to assess dietary exposures from clothianidin in food as follows:

i. *Acute exposure.* Acute dietary risk assessments are performed for a food-use pesticide if a toxicological study has indicated the possibility of an effect of concern occurring as a result of a 1-day or single exposure. The Dietary Exposure Evaluation Model (DEEM®) analysis evaluated the individual food consumption as reported by respondents in the United States Department of Agriculture (USDA) 1994–1996 and 1998 nationwide Continuing Surveys of Food Intake by Individuals (CSFII) and accumulated exposure to the chemical for each commodity. The following assumptions were made for the acute exposure assessments: The acute analysis was a conservative, Tier I assessment which was based on tolerance level residues and the assumption of 100% crop treated. Although the only proposed uses for clothianidin are on canola and corn, clothianidin is a major metabolite of thiamethoxam which has many registered uses and several pending uses. As a result, residues of clothianidin which would theoretically result from the metabolism of thiamethoxam were included in the analysis. In crop field trials and in animal feeding studies, the quantities of both clothianidin and thiamethoxam

were measured. The ratio of clothianidin to thiamethoxam in each commodity was multiplied by the respective thiamethoxam tolerance level to arrive at the theoretical maximum clothianidin residue level which would be present. These maximum clothianidin residues were used in the acute analysis. For the commodities which have both thiamethoxam tolerances and proposed clothianidin tolerances (i.e., sweet corn, field corn, pop corn, canola, and milk), the proposed clothianidin tolerances were added to the residues which result from use of thiamethoxam.

As this is a Tier I assessment, dietary exposure and risk at the 95th percentile of exposure are reported. The general U.S. population and all population subgroups have exposure and risk estimates which are below EPA's LOC (i.e., the aPADs are all below 100%). The most highly exposed population subgroup is children 1 to 2 years of age, which utilizes 16% of the aPAD.

ii. *Chronic exposure.* In conducting this chronic dietary risk assessment, the DEEM® analysis evaluated the individual food consumption as reported by respondents in the USDA 1994–1996 and 1998 nationwide CSFII and accumulated exposure to the chemical for each commodity. The following assumptions were made for the chronic exposure assessments: The chronic analysis was a conservative, Tier I assessment which was based on tolerance level residues and the assumption of 100% crop treated. As stated previously, although the only proposed uses for clothianidin are on canola and corn, clothianidin is a major metabolite of thiamethoxam which has many registered uses and several pending uses. As a result, residues of clothianidin which would theoretically result from the metabolism of thiamethoxam were included in the analysis. In crop field trials and in animal feeding studies, the quantities of

both clothianidin and thiamethoxam were measured. The ratio of clothianidin to thiamethoxam in each commodity was multiplied by the respective thiamethoxam tolerance level to arrive at the theoretical maximum clothianidin residue level which would be present. These maximum clothianidin residues were used in the chronic analysis. For the commodities which have both thiamethoxam tolerances and proposed clothianidin tolerances (i.e., sweet corn, field corn, pop corn, canola, and milk), the proposed clothianidin tolerances were added to the residues which result from use of thiamethoxam.

The general U.S. population and all population subgroups have exposure and risk estimates which are below EPA's LOC (i.e., the chronic population adjusted doses (cPADs) are all below 100%). The most highly exposed population subgroup is children 1 to 2 years of age, which utilizes 18% of the cPAD.

iii. *Cancer.* EPA has determined that clothianidin is not likely to be a human carcinogen and EPA, therefore, does not expect it to pose a cancer risk. As a result, a quantitative cancer dietary exposure analysis was not performed.

2. *Dietary exposure from drinking water.* The Agency lacks sufficient monitoring exposure data to complete a comprehensive dietary exposure analysis and risk assessment for clothianidin in drinking water. Because the Agency does not have comprehensive monitoring data, drinking water concentration estimates are made by reliance on simulation or modeling taking into account data on the physical characteristics of clothianidin.

The Agency uses the First Index Reservoir Screening Tool (FIRST) or the Pesticide Root Zone/Exposure Analysis Modeling System (PRZM/EXAMS), to produce estimates of pesticide concentrations in an index reservoir.