

US EPA ARCHIVE DOCUMENT



DATE: June 19, 2006

**ACTION MEMORANDUM**

**SUBJECT:** Inert Reassessments: One Exemption from the Requirement of a Tolerance for Dimethyl sulfoxide (CAS Reg. No. 67-68-5)

**FROM:** Pauline Wagner, Chief *Pauline Wagner 6/19/06*  
Inert Ingredient Assessment Branch

**TO:** Lois A. Rossi, Director  
Registration Division

**I. FQPA REASSESSMENT ACTION**

**Action:** Reassessment of one inert ingredient exemption from the requirement of a tolerance. Current exemption is to be maintained.

**Chemical:** Dimethyl sulfoxide

**Table 1. CFR and CAS Registry Numbers and Names**

| 40 CFR   | Inert Ingredients  | RAC  | Pesticides   | CAS Reg. No. & Name              |
|----------|--------------------|------|--|----------------------------------|
| 180.1083 | Dimethyl sulfoxide | Peas | Solvent or cosolvent in formulation with:<br>(a) Carbaryl (1-naphthyl methyl-carbamate),<br>(b) O-O-Diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl) phosphorothioate. | 67-68-5<br>Methane, sulfinylbis- |

**Use Summary:** DMSO is used as a solvent for many organic compounds including fats, carbohydrates, dyes, resins, and polymers. It is also used to cryopreserve and store cultured cells. When mixed with water, DMSO is used as antifreeze or

hydraulic fluid. DMSO is also used as an inert ingredient (solvent/cosolvent) in pesticide products.

**FQPA Safety Finding:** In the Federal Register of December 7, 1983 (48 FR 54818), EPA issued a final rule establishing an exemption from the requirement of a tolerance for DMSO when used as an inert ingredient (solvent or cosolvent) in pesticide formulations with two active ingredients [carbaryl (1-naphthyl methyl-carbamate) and/or O-O-diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl) phosphorothioate] on the raw agricultural commodity (RAC) peas. EPA concluded in the final rule that “the exemption would protect the public health and is established as set forth” as described in Table 1 above. A review of the available information developed since the establishment of this tolerance exemption did not reveal any data that would alter the original risk conclusion for the use of DMSO as a solvent/cosolvent on peas under 40 CFR 180.1083. Therefore, the conclusions of the final rule still apply. Because the final rule was published prior to the enactment of FQPA, additional safety findings are now required, including an assessment of whether there is increased sensitivity to infants and children (i.e., developmental and reproductive effects). The Agency has just concluded the reassessment of the use of DMSO as an inert ingredient under 40 CFR 180.920 on growing crops, and concluded that there is no sensitivity to infants and children and the exemption can be reassessed as is. Therefore, the conclusion for DMSO under 40 CFR 180.920 applies to 180.1083. Pertinent segments of the reassessment document for DMSO under 180.920 are provided below.

**Special Considerations for Infants and Children:** In acute, subchronic, and chronic studies, DMSO has been demonstrated to be of low toxicity. Developmental toxicity was observed only at maternally toxic doses at concentrations of DMSO at or greater than the limit dose. Based on this information, there is no concern, at this time, for increased sensitivity to infants and children to DMSO when used as an inert ingredient in pesticide formulations. For the same reason, a safety factor analysis has not been used to assess risk and, therefore, the additional tenfold safety factor for the protection of infants and children is also unnecessary.

**Aggregate Exposure:** In examining aggregate exposure, the FFDCA section 408 directs EPA to consider available information concerning exposures from the pesticide residue in food and all other non-occupational exposures, including drinking water from ground water or surface water and exposure through pesticide use in gardens, lawns, or buildings (residential and other indoor uses). For DMSO, a qualitative assessment for all pathways of human exposure (food, drinking water, and residential) is appropriate given the lack of human health concerns associated with exposure to DMSO as an inert ingredient in pesticide formulations.

**Cumulative Exposure:** Section 408(b)(2)(D)(v) of the FFDCA requires that, when considering whether to establish, modify, or revoke a tolerance, the Agency consider “available information” concerning the cumulative effects of a particular pesticide’s residues and “other substances that have a common mechanism of toxicity.” Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, EPA has not made a common mechanism of toxicity finding as to DMSO and any other substances, and this material does not appear to produce a toxic metabolite produced by other substances. For the purposes of this tolerance action, therefore, EPA has not assumed that DMSO has a common mechanism of toxicity with other substances. For information regarding EPA’s efforts to determine which chemicals have a common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the policy statements released by EPA’s Office of Pesticide Programs concerning common mechanism determinations and procedures for cumulating effects from substances found to have a common mechanism on EPA’s website at <http://www.epa.gov/pesticides/cumulative>.

**Human Health Risk Characterization:** The tolerance exemption under 40 CFR 180.1083 permits the use of DMSO as an inert ingredient (solvent or cosolvent) in pesticide formulations with two active ingredients [carbaryl (1-naphthyl methylcarbamate) and/or O-O-diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl) phosphorothioate] on the raw agricultural commodity (RAC) peas. In acute, subchronic, and chronic studies, DMSO has been demonstrated to be of low toxicity. Developmental toxicity was observed only at maternally toxic doses at concentrations of DMSO at or greater than the limit dose. Residential (inhalation and dermal) exposures to DMSO are possible, but as an inert ingredient in two pesticide formulations limited to use on peas, it is not expected to be available at levels that would cause toxic effects or produce skin irritation. Dietary (food and drinking water) exposures of concern to residues of DMSO are not expected due to its limited use on peas and its physical and chemical properties, including high volatility and rapid photodegradation in the ambient air.

Taking into consideration all available information on DMSO, it has been determined that there is a reasonable certainty that no harm to any population subgroup will result from aggregate exposure to DMSO when considering exposure through food commodities and all other non-occupational sources for which there is reliable information. Therefore, it is recommended that the one exemption from the requirement of a tolerance established for residues of DMSO under 40 CFR 180.1083 when used as a solvent/cosolvent can be considered reassessed as safe under section 408(q) of the FFDCA.

## II. MANAGEMENT CONCURRENCE

I concur with the reassessment of the exemption from the requirement of a tolerance for the inert ingredient Dimethyl sulfoxide (CAS Reg. No. 67-68-5). I consider the exemption established under 40 CFR 180.1083 to be reassessed for purposes of FFDCA's section 408(q) as of the date of my signature, below. A Federal Register Notice regarding this tolerance exemption reassessment decision will be published in the near future.



Lois A. Rossi, Director  
Registration Division

Date: *June 20, 2006*

CC: Debbie Edwards, SRRD  
Joe Nevola, SRRD