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and packaged or bagged processed) cannot be separated because, as discussed earlier, a single commodity may be treated more than once at different stages of production. EPA has published a final revocation notice for the FAR for residues of dichlorvos on packaged or bagged nonperishable processed food. If this revocation becomes effective and the related uses are canceled under FIFRA, this source of dietary risk will be eliminated.

TABLE	2.—Upper	Bound	CAN	CER
RISK	ESTIMATES	FROM	USE	OF
DICHLORVOS				

Tolerance Expression	Upper Bound Cancer Risk	
Use of Dichlorvos		
Packaged or bagged, non-perishable proc- essed food and RACs (including bulk stored, regardless of fat con- tent)	3.4 x 10 ⁻⁶	
Milk	6.2 x 10⁻7	
Eggs	7.1 x 10 ⁻⁸	
Red Meat	1.1 x 10 ⁻⁷	
Poultry	3.7 x 10-8	
Agricultural uses Lettuce Cucumbers Tomatoes Mushrooms Radishes	2.1 x 10 ⁻⁷ 1.6 x 10 ⁻⁷ 2.6 x 10 ⁻⁸ 1.4 x 10 ⁻⁸ 2.6 x 10 ⁻⁹ 9.8 x 10 ⁻¹⁰	
Naled derived dichlorvos	7.2 x 10 ⁻⁷	
Total	5.1 x 10 ⁻⁶	

2. Occupational and residential risks—i. Carcinogenicity. The PD 1 in 1988 estimated risks from cancer to pesticide workers and residents based on dermal and inhalation exposure. Since that time, as discussed earlier in this unit, EPA has decided that it is no longer appropriate to quantify cancer risk for the inhalation and dermal routes, as discussed above in Unit II. Therefore, cancer risks for workers and residents by the inhalation and dermal routes are no longer a concern for this preliminary determination.

ii. ChE inhibition. The duration and frequency of exposure vary considerably

for the numerous uses of dichlorvos. MOEs are based upon comparison of exposure estimates against NOELs of 0.5 mg/kg/day for short-term, 0.1 mg/kg/day for intermediate, and 0.05 mg/kg/day for long-term exposure scenarios. The NOELs are based on brain ChE and/or cholinergic signs, and were derived from toxicological studies by the oral route; however, dermal exposure is an important route of occupational/ residential exposure. Therefore, the Agency's oral exposure estimates are adjusted for the dermal absorption of dichlorvos (factor of 0.11), to account for the route-to-route extrapolation.

For most uses in Table 1 of Unit II.C.2. of this document, a single exposure estimate and corresponding MOE are given. However, this was not possible for mushroom houses, greenhouses, and dairy barns because of the number of potential application methods and the inability to combine the various studies into one data set. The Agency does not believe there are any naled-derived dichlorvos risks resulting from occupational/residential exposure because a tank mix study showed that naled did not readily degrade to dichlorvos under actual use conditions. This is consistent with the finding that dichlorvos results from plants metabolizing naled, as discussed above.

MOEs are used by EPA as an indication of the level of risk from ChE inhibition. EPA is generally concerned about exposures to humans where the MOEs are less than 100, since they may not provide an adequate MOE after accounting for uncertainty (i.e, extrapolation from animals to humans and variability in the human population). MOEs are less than the uncertainty factor of 100 for the majority of sites examined in this assessment, and some are less than 10. MOEs fall below 100 for both the applicator of dichlorvos and for individuals living or working in treated areas (Ref. 55).

The occupational and residential risk assessment contains the following uncertainties that could result in an underestimate or overestimate of the true risk: (1) In the absence of actual dermal toxicity studies, toxicity by the dermal and oral routes were assumed to be comparable after adjusting for differences in absorption, (2) subchronic and chronic inhalation data are available, and EPA assumed that toxicity by the oral and inhalation routes are comparable, (3) the NOEL used to calculate short-term MOEs is based on cholinergic signs, (4) the exposure parameters are dated and may have changed for some scenarios, (5) in many cases surrogate exposure data

were used for estimating occupational and residential exposure, and in the absence of such data, the Agency made assumptions that a particular exposure should not exceed that of a scenario where surrogate or actual data existed, and (6) MOE estimates may vary significantly depending on the method of application and protective clothing assumptions.

There are additional uncertainties regarding potential risks to children exposed to dichlorvos from residential uses, including variability in activity patterns, the extent of non-dietary oral ingestion, due to hand object-to-mouth activity, respiratory rate and tidal volume, surface area to volume ratio, dermal absorption, and toxicological susceptibility. Consideration of children's risk could possibly have resulted in lower MOEs. However, the Agency believes that the proposed actions will nonetheless serve to adequately protect children from residential exposure. The Agency is currently conducting research to provide refinements to assess children's exposure, and is working to update our guidelines for household and work related exposures.

3. Analysis of comments on the PD 1. The Agency received comments relating to risks discussed in the PD 1. Rebuttal comments and complete Agency responses are on file in the dichlorvos Public Docket. The following is a summary of the major comments, and the Agency's responses.

Comment. Anivac Chemical Corporation argued that the "weight-ofthe evidence" from animal studies is limited or inadequate to assess human cancer risk, and that the Group B2 classification is not appropriate.

Agency Response. This comment is moot since dichlorvos was reclassified from a B2 to a C carcinogen, as explained above.

Comment. With regard to the pancreatic tumors seen in F344 rats, "Since there are no pharmacokinetic or physiological reasons to expect females to be unique in their responsiveness to dichlorvos, the absence of an effect in females weakens the significance of the effect increase in males."

Agency Response. The pancreatic acinar adenomas were eliminated from consideration in the fourth cancer peer review.

Comment. With regard to the dichlorvos swine feeding study, the registrant states that the "histopathological results are of value for the assessment of the carcinogenicity of dichlorvos in a third species."

Agency Response. The Agency does not believe that this study would be