CONSUMERS UNION • FARMWORKER JUSTICE FUND
NATIONAL CAMPAIGN FOR PESTICIDE POLICY REFORM

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COMMENTS ON EPA'S JUNE 22, 2000 "PROPOSED GUIDANCE ON CUMULATIVE RISK ASSESSMENT OF PESTICIDE CHEMICALS THAT HAVE A COMMON MECHANISM OF TOXICITY" – DOCKET NUMBER OPP-00658A

These comments are submitted on behalf of Consumers Union of United States, Inc. (CU),[1] Farmworker Justice Fund, Inc.,[2] and the National Campaign for Pesticide Policy Reform.[3] Since early 1998, CU has submitted comments on several occasions on the importance of timely implementation of the cumulative risk assessment provision of

[1] Consumers Union is a nonprofit membership organization chartered in 1936 under the laws of the State of New York to provide consumers with information, education and counsel about goods, services, health, and personal finances and to initiate and cooperate with individual and group efforts to maintain and enhance the quality of life for consumers. Consumers Union's income is solely derived from the sale of *Consumer Reports*, its other publications and from noncommercial contributions, grants and fees. In addition to reports on Consumers Union's own product testing, *Consumer Reports* regularly carries articles on health, product safety, marketplace economics and legislative, judicial and regulatory actions that affect consumer welfare. Consumers Union's publications carry no advertising and receive no commercial support.

[2] The Farmworker Justice Fund, Inc. (FJF) is a nonprofit, national advocacy organization which is dedicated to improving the living and working conditions of migrant and seasonal farmworkers and their families. For two decades, FJF has advocated for the reduction and/or elimination of the use of toxic pesticides.

[3] The National Campaign for Pesticide Policy Reform (NCPPR) was formed in December, 1993. The goal of the campaign is to press for new pesticide policy reforms that better protect children from pesticide exposures and reduce the use of harmful pesticides.

the Food Quality Protection Act (FQPA). In conjunction with the Natural Resources Defense Council (NRDC), CU submitted detailed comments to the Scientific Advisory Panel (SAP) as part of its session entitled "Issues Pertaining to Exposure Assessment and Estimating Cumulative Risk."[4] This session of the SAP was held on December 9, 1999.

Consumers Union consultant Dr. Charles Benbrook delivered oral comments during the September, 1999 SAP meeting on the Environmental Protection Agency (EPA)'s proposed cumulative risk assessment (CRA) methodology. This meeting focused on Chapters 4 and 6 of the draft CRA document, which cover hazard identification and dose-response calculations.

Again in conjunction with NRDC, CU submitted detailed comments on June 6, 1999 in response to EPA's draft science policy paper "Choosing a Percentile of Acute Dietary Exposure as a Threshold for Regulatory Concern."[5] These comments focused on the distribution of residue levels in the U.S. Department of Agriculture (USDA)'s Pesticide Data Program (PDP) and highlighted the importance of proper and full utilization of all residue values in this dataset. We also analyzed the distribution of consumption values in recent USDA nutrition surveys.

Consumers Union also commented on EPA's initial proposed method for identifying pesticides that pose risk through a common mechanism of toxicity. Our comments were dated October 8, 1998.[6]

During the SAP's March 24-25, 1998 meeting on organophosphate (OP) risk assessment issues, CU submitted a series of comments,[7] including:

- "Application of the Ten-Fold Safety Factor Called for in the FQPA;"
- "Basis for Establishing the Common Mechanism of Action of Organophosphate and Carbamate Insecticides;"
- "Refinements Needed in EWG's Probabilistic Risk Assessment Methodology;" and
- "Refining Monte Carlo Exposure Assessments."

EPA is correct in noting that the June 22, 2000 draft CRA guidance document embodies the major components of several earlier science policies. Rather than repeating our major comments on each science policy, we wish to reference as part of these comments the earlier statements noted above.

[4] These comments are accessible at <http://ecologic-ipm.com/cumulative_risk.pdf>.
[5] Accessible at <http://ecologic-ipm.com/999_comments.pdf>.
[6] Accessible at <http://ecologic-ipm.com/commontox.html>.
[7] Accessible at <http://ecologic-ipm.com/cucommt.html>.

Major Points

We applaud the progress EPA has made in refining the CRA methodology and explaining how it will be applied. We agree the methodology should be viewed as a "work in progress," as stated on page 11 of the June 2000 guidance document. With experience and further research, EPA correctly states that it will be able to refine CRA methods and that better data will become available on the exposure side of the equation. Periodically new toxicological data will also require changes in risk estimates for a particular active ingredient.

CRA Must Provide the Basis for Managing Risk Trading

The agency does not emphasize, as it should, the likelihood of significant annual shifts in pesticide use and risk patterns once the agency starts imposing risk mitigation measures on risk-driver chemicals within a Cumulative Assessment Group (CAG). This is already happening with the OPs and will continue for at least several years. We applaud the agency for taking timely action on a few risk-driver OP insecticides and children's food uses and hope the agency will continue to impose risk mitigation measures as the need for them becomes clear.

As a result, a series of incremental steps will be required to achieve the FQPA's safety standard. How farmers respond to the loss of a given OP will determine whether there is a substantial shift of use and risk to other OPs and carbamates, or whether lower-risk pest management systems and products are instead adopted. The former response will trigger the need for further, more encompassing OP and carbamate risk mitigation measures, the latter will not.

Accordingly, in stating the various goals of a CRA (page 12 and elsewhere), the agency should stress that a CRA provides the analytical framework and empirical basis for managing and minimizing "risk trading" from one or more pesticides to others within a CAG.

EPA Should Move Ahead with CRAs and Deal with Known Risk-Drivers

We support continuing efforts to sharpen CRA methods and results, but not at the expense of further delay in the imposition of clearly necessary risk reduction actions.

We feel that the CRA state-of-the-art, as described in the June 2000 guidance document, is sufficient to move ahead with a CRA encompassing the organophosphate and carbamate insecticides, as recommended by the SAP (see SAP Report No. 99-05, November 18, 1999).[8] The decision to include the OPs and carbamates in a single CAG is solidly science-based and critical in terms of real-world pesticide use patterns and risk mitigation. There are some 120 OP and carbamate insecticide crop-food combinations for

[8] Accessible at <http://www.epa.gov/scipoly/sap/1999/september/finalrpt.pdf>.

which the PDP found residues in 1994-1997 testing; carbamates accounted for a quarter of these cases. For almost all crops, there are OP alternatives for all carbamates now used, and vice versa. Accordingly, cumulative risks must be managed across all OPs and carbamates retained for use on major children's foods in order to meet cumulative risk mitigation goals.

Refinements will Most Likely Increase Cumulative Risk Estimates

Most refinements in CRAs will entail expanding the scope of exposures covered in the assessment and/or new toxicological data. In most cases, incorporating new exposure or toxicological data into a CRA will lead to increases in estimates of cumulative risks. Therefore, the lack of perfect CRA methods or comprehensive exposure data are not reasons to postpone risk mitigation measures once EPA has initial CRA results in hand which show that certain pesticides and crop uses contribute heavily to cumulative risks in excess of what EPA judges are acceptable under the FQPA's safety standard.

Exceptions could arise in cases where real-world data shows exposures lower than default assumptions incorporated into preliminary CRAs. Most sensitivity analyses done on various default assumptions have shown modest differences across the range of plausible assumptions.

When EPA receives new toxicological data on a pesticide, the new data rarely result in a decision to increase the chemical's acute or chronic NOAEL or Reference Dose, or in the case of oncogens, its cancer potency factor (or, Q*). In the case of the OPs, the EPA has imposed an extra 3-fold or 10-fold margin of safety in some cases because of the lack of a developmental neurotoxicity study. As these critical studies are completed and submitted, the agency may choose to drop the extra safety factor, thereby leading to an increase in Reference Doses, other things equal. But in some portion of these cases, it is likely that longer-term developmental studies will produce evidence of adverse effects at lower doses than observed in other previous studies. As a result, the chemical's Reference Dose is likely to be reduced even if the agency decides to drop an extra FQPA-driven safety factor.

While EPA's initial cumulative assessment of OP-carbamate risks will be incomplete, we are confident it will demonstrate that cumulative OP-carbamate exposures and risk exceed by a substantial margin a level deemed acceptable under the FQPA's "reasonable certainty of no harm" standard. This finding will compel EPA to move forward with further risk mitigation measures.

The results of the initial CRA will point the agency in the right direction since it will produce a reliable ranking of risk-driver foods and crops based largely on the highly reliable PDP residue data from the USDA. In all our comments we have urged EPA to

move ahead with risk mitigation measures for known OP and carbamate dietary risk-drivers since it is clear that cumulative OP-carbamate exposure and risks must be reduced.

Actions already announced by EPA on known OP risk-drivers could markedly reduce exposure and risks in the next few years compared to the residues in the diet upon passage of the FQPA. Based on our analysis, further significant OP dietary risk reduction can be achieved by targeting about 50 to 75 additional chemical-crop combinations. In many cases, changes in tolerance levels and labeled uses patterned after those imposed on the apple and pear uses of chlorpyrifos will vastly reduce, if not eliminate detectable residues in the diet.

The results of CRAs should be updated annually, incorporating new residue data. The results should guide the agency in determining whether, and to what degree exposures and risk must still be reduced. Through an iterative process, the agency will both refine the accuracy of its overall CRA estimates and mitigate exposures stemming from those uses contributing most heavily to risk.

Over time, the gap between acceptable risks and current estimated OP-carbamate risks, based on residues in the diet, water, and from other exposures, will narrow. So too will the scope of new risk mitigation measures needed in a given year to reduce exposures and risk to an acceptable level.

Distinction Between a CMG and CAG

EPA continues to propose identification of both a "Common Mechanism Group" (CMG), like the OPs and carbamates, and a subset of a CMG called the "Cumulative Assessment Group" (CAG). Some chemicals in a CMG would drop out of the CAG because of a lack of data, use, or exposure. We continue to question the wisdom of this approach since it may serve to prematurely truncate the scope of a CRA. In the case of the OPs and carbamates, for example, there will likely be shifts in acres treated from today's most popular, higher-risk OPs and carbamates to other, not widely used, lower-risk OPs (i.e., acephate and malathion) and carbamates (i.e., carbaryl). EPA needs to include lower-risk products in CAGs in order to accurately track shifts in exposure patterns and risks. Other reasons why EPA should only rarely exclude a chemical in a CMG from a CAG are set forth in earlier comments cited above.[9]

Basis for Establishing Relative Potency

In establishing the relative potency of pesticides within a CAG, EPA proposes to use a "Point of Comparison" (PoC) in the dose-response curve for the common toxic effect. The guidance document states that relative potencies should be based on results from studies measuring the same endpoint in the "same species/strain/sex and duration of exposure for each chemical member of the [CAG] group." We accept this formulation as

[9] See especially <http://ecologic-ipm.com/cucommt.html>.

an ideal goal, but in the real world EPA will not have access to such a homogenous set of toxicology studies across a large CAG like the OPs and carbamates.

The goal should be to develop a defensible assessment of the relative potencies across members of a CAG. For most OPs and carbamates, EPA will have a dozen or more roughly comparable data-points on key endpoints. In all likelihood, there will be a relatively stable pattern in NOAELs when comparing a highly toxic OP/carbamate like methyl parathion/aldicarb to a less toxic one like malathion/carbaryl. In the absence of exactly comparable studies, the EPA should rely on the patterns of potency levels in a set of representative studies clearly related to the toxic endpoint of concern. Such an approach is clearly called for by the agency's pledge in several places in the guidance document to rely on the "weight of the evidence" in making critical toxicity and safety judgements.

Toward this end, we urge the agency to adopt as one of its general rules that in the absence of comparable toxicology data, a weight of evidence approach will be used to estimate relative potency factors, drawing on all closely related studies and patterns in the levels of NOAELs.

Because exactly comparable data will never be on hand, the agency notes that adjustments may be needed in the case of certain pesticides within a CMG. Whenever EPA makes such an adjustment it should do so on the basis of the weight of the evidence and when deemed necessary, build in an added chemical-specific uncertainty factor as clearly called for by the FQPA's 10-X provision.

The Proposed CRA Group Uncertainty Factor Circumvents the Statute

The guidance document proposes to apply a single group uncertainty factor in carrying out a CRA. We accept and agree with the logic supporting application of a single group uncertainty factor, but are deeply concerned that EPA may ignore one of the core provisions of the FQPA in setting CRA group uncertainty factors – the 10-X provision.

The FQPA states clearly that in the case of a pesticide, or group of pesticides working through a common mechanism, the agency is to impose up to a 10-fold additional safety factor in the absence of reliable, complete data, or in cases where there is evidence of unique developmental risks stemming from exposures during pregnancy or in the first years of life.

On page 21 of the guidance document where definitions are set forth, this group uncertainty factor is defined in terms of intra- and inter-species variability in response to exposures to chemicals, and is equivalent to the standard 100-fold safety factor the agency uses in converting a NOAEL to a Reference Dose. The text goes on to state that data quality across all chemicals in a CAG, and the "weight of the evidence," will determine whether an added safety factor is justified in terms of completeness of the database. No mention is made, however, of any other factors impacting the establishment CRA group

uncertainty factor.

On page 49 in the section on dose-response assessment and characterization, the agency states that the "Objective" of a CRA group uncertainty factor is:

> "To account for uncertainties that are common and inherent to the CAG, such as intra- and inter-species differences, as well as to reflect the remaining uncertainty concerning the overall quality of the database that pertains to the CAG as a whole."

Yet later in the guidance document (pages 71 to 75), the agency appears to state that unique pre- and post-natal toxicity will also be considered in setting a CRA group uncertainty factor. The agency's intentions are unclear in part because one or more key lines of text are missing from the cell in Table 6-1 where the reasons for applying an added FQPA safety factor in a CRA are explained.

The document needs to be crystal clear – and consistent – regarding when and why an added FQPA uncertainty factor will be included in a CRA group uncertainty factor. At a minimum, the draft guidance document is deficient in its earlier treatment of this issue. The "Objective" statement quoted above, for example, needs to be revised by adding a new phrase at the end:

> "To account for uncertainties that are common and inherent to the CAG, such as intra- and inter-species differences, as well as to reflect the remaining uncertainty concerning the overall quality of the database that pertains to the CAG as a whole or the potential of chemicals within the CAG to pose unique pre- and post natal developmental risks."

We object to another key aspect of the proposed approach for setting a CRA group uncertainty factor. On page 74, the guidance document states that the decision to include an added FQPA safety factor in a CRA will be based solely on whether there is evidence of unique pre- or post-natal susceptibility relative to the toxic effect underlying the CAG. In the case of the OPs and carbamates, the toxic effect will in all likelihood be cholinesterase inhibition – the known common toxic effect for which the agency has roughly comparable data across all pesticides within the CMG. Hence, the decision to impose an added FQPA safety factor will be driven by whether young animals are more susceptible to cholinesterase inhibition than older animals.

We see neither scientific justification nor policy rationale for such a limited field of vision when applying the 10-X provision in the context of a CRA. This approach is clearly inconsistent with the agency's pledge in several other parts of the guidance document to base decisions on the "weight of the evidence" across all relevant studies.

In the case of the OPs and carbamates, there is consensus in the scientific community that developmental neurotoxicity studies are among, if not the most relevant

indicator of, unique impacts on developing and young animals. Yet the agency has reliable developmental neurotoxicity data on perhaps only one-third of OPs and carbamates; several of the studies show clear evidence of developmental neurotoxicity. Most scientists expect that a significant percent of all OPs and carbamates will demonstrate developmental effects once fully tested with appropriate sensitivity experimental protocols. Indeed, a developmental neurotoxicity data call-in is in effect, which will greatly enhance knowledge of OP developmental effects in the next few years.

We are certain that EPA will have evidence of developmental neurotoxicity in the case of several OPs and carbamates. We further expect that several of these studies will demonstrate a common mechanism of action. Hence, EPA faces a choice. The agency could decide to simply carry out a second OP-carbamate CRA with the subset of pesticides determined to pose developmental neurotoxicity. In this CRA, the statute would appear to require an added FQPA safety factor in the group uncertainty factor, unless the agency determines that current developmental tests and data fully capture the potential added risks faced by the young. We find it hard to believe that the Administrator could defend such a finding given the state of the art in assessing developmental risks.

Alternatively, and in our opinion preferably, the agency should take action now on the clear evidence of heightened developmental neurotoxicity among young animals in the case of several OPs and carbamates as it carries out a CRA based on cholinesterase inhibition. It can do so by imposing an added FQPA safety factor when setting the group uncertainty factor – an option precluded if EPA decides that unique susceptibility only matters in reference to the common toxic effect underlying a CMG/CAG.

Focus on Risk Drivers Must Not Obscure Other, Potentially Significant Risks

EPA states as a general principle that the agency will focus on major risk-drivers and will defer less important contributors to risk. It also proposes a set of criteria to determine which exposure routes, pathways, and chemicals to exclude from a CAG assessment. In cases where data are lacking and exposures are not included in a CRA, the agency states that it will continue to assess these other routes of exposure and risks in parallel and qualitatively.

We question this approach and feel it is inconsistent with the clear intent of the statute. The FQPA requires EPA to carry out CRAs that encompass all pesticides in a CMG and all routes of exposure. When data are limited or methods uncertain, the FQPA provides a clear remedy – imposition of an added margin of safety to limit the chances that risks are underestimated. Congress was right in building this key provision into the nation's pesticide law. The EPA should not undermine its intended impact by deferring consideration of certain chemicals and exposures.

Instead, we suggest that EPA strive to include all routes, pathways and chemicals in a CMG with its CRA. We know that new methods and additional data will be needed to do so comprehensively, even in the case of a CMG as widely studied as the OPs and

carbamates. As more and better data are available and new methods perfected, the agency should include them in future CRAs. For exposures that the agency has no way of estimating, the agency should reserve at least a small portion of the allowable "risk cup," pending receipt of better data and more refined estimates.

Specific Comments on Questions Raised

EPA raises several questions for public comment (pages 86 through 90). Several of the points made above speak to the questions raised. In addition, we offer the following specific responses.

Question 1 refers to the adequacy of the factors set forth that will determine the chemicals that belong within a CMG.

We applaud the agency for clarifying in this guidance document (see page 10) that it will consider exposures to chemicals other than pesticides that might pose risks to humans through the common mechanism of action shared by a pesticide CMG/CAG. We urged the agency to recognize the need to do so in response to the statute, which states that a CRA must be based upon the cumulative effects on infants and children of pesticide residues "and other substances that have a common mechanism of toxicity." (FFDCA Sect. 408 (b)(2)(C)(i)(III)).

Question 3 relates to the basis of the CRA group uncertainty factor.

As stated above, the document is neither clear nor consistent regarding when a group uncertainty factor above 100 will be imposed. This is a serious deficiency, given the importance of clarity in explaining when and how the FQPA 10-X provision will be invoked in carrying out a CRA. If the EPA imposed an added FQPA safety factor on account of unique pre- and post-natal risks stemming from exposures to several individual chemicals within a CMG/CAG, there is no plausible justification for not also imposing a comparable added safety factor on the group as a whole.

Question 6.1 asks whether EPA should conduct separate pathway assessments for dietary, water, and residential exposures.

Because of the availability of high quality residue data on pesticides in children's foods, the agency is able to use Monte Carlo simulations to derive accurate probabilistic estimates of exposure and risks from such foods. But PDP-based dietary exposure estimates provide an accurate assessment of exposures only for those foods tested. Hence, PDP-based dietary risks are properly interpreted as reliable lower-bound estimates of dietary risks facing infants and children. For this reason, EPA has been correct in its

policy decision to impose risk mitigation measures on individual OPs when single chemical assessments show excessive risks, based just on PDP-based lower-bound dietary risks.

Other exposure routes and chemicals will only add to risks from a CMG/CAG. The statute is clear that EPA must estimate these risks in the context of a CRA using the best data and methods available. The FQPA also provides a clear remedy when the agency feels the available data and methods are unreliable – imposition of an added uncertainty factor. Accordingly, the agency should include such additional exposures and chemicals in a CRA by some combination of three actions:

- Reserving a portion of a CMG/CAG "risk cup" for uncertain exposures and risks;
- Estimating such exposures and risk with the best data/methods available; and
- Imposing an added group uncertainty factor on the CRA to account for these additional exposures and risk.

Question 6.4 specifically asks whether it is appropriate to use residue field trials and use data to estimate dietary exposures in crops/foods not included in the PDP.

Unless the agency has a better option, residue trial data coupled with use data provide the firmest scientific grounds to estimate dietary exposures. So yes, these data should definitely be used in extending a CRA to all crops treated with pesticides within the CMG/CAG.

Question 7 addresses the deferral criteria and policy set forth as part of the agency's effort to focus on risk-drivers.

We strongly agree the agency must focus on risk-drivers, but worry that it might miss some if it prematurely excludes from analysis too many routes of exposure or chemicals. Until the results of a reasonably complete CRA are available, how will the agency know whether a given exposure route or chemical adds a trivial increment to CMG/CAG risk?

As stated earlier, rather than defer certain routes of exposure or chemicals, the FQPA directs EPA to estimate exposures and risk as accurately as possible. Concurrent with the agency's focus on known risk-drivers, better data and refined methods should be sought for other routes of exposure until there is an adequate and verified empirical basis to dismiss a route or chemical from a CMG. Even in such cases, the agency must watch out for substitution in pesticide use patterns as risk mitigation measures are imposed on known risk-drivers. Uses that contribute modestly to total OP-carbamate exposure and risks today may emerge as risk drivers within a few years if farmers choose to retain a major role for insecticides in these families of chemistry as the FQPA implementation process moves forward.

Question 8.1 seeks comment on whether it is "reasonable" to carry out region-specific cumulative assessments for different pathways.

Generally, food is distributed on a national basis, and therefore there is no reason to conduct a region-specific assessment on dietary exposure. However, we believe it would be helpful – and in fact necessary – to do so in regard to specific "hot spots," such as for water (e.g., atrazine in the Midwest) or region-specific residential exposures (i.e., drift onto homes near intensively farmed fruit or vegetable fields sprayed with OPs like azinphos-methyl). These regional assessments should be incorporated into the national assessment.

In implementing the FQPA, EPA needs to remain focused on its core responsibilities in order to avoid slipping further behind in the implementation schedule set forth in the act. Completing a nationwide CRA of the OPs and carbamates must be a first priority and will confirm the need for significant risk mitigation measures. A few years after such measures have been put in effect, the agency will need to refine and recalculate cumulative risks. At that time EPA can evaluate whether there appear to be unique exposure and risk patterns in certain parts of the country – other than those found in the regional "hot spots" – and on the basis of insights gained, take appropriate additional actions.

Sincerely,

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