could be, but had the self-assurance of an ignorant beginner. The Radio supplied me with a tape recorder of the size of a trunk and a technician who operated it. One of the interesting features of the interview was that I asked Semenov to prognosticate about science from the perspective of the mid–1960s, and he did. From today's perspective, he did not say anything extraordinary, but this is what makes his prognostication so valid. I was happy to include Semenov in my first interviews volume.

For six years (1995-2000) I published most of my interviews in The *Chemical Intelligencer*, a now defunct magazine. I have now an interview in each issue of the magazine *Chemical Heritage* published by the Chemical Heritage Foundation. These interviews have been my second university education and I am happy to share all that I have learned from them with everyone.

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Photos: I. Hargittai.

www.tki.aak.bme.hu/hargittai/hargittai.htm

Pesticide Residues

IUPAC Representative's Report on the 34th Codex Committee Session

The Codex Committee on Pesticide Residues (CCPR) convened at The Hague this past May to continue its mission of promulgating recommendations on international standards for maximum residue level (MRL) of pesticides on internationally traded agricultural commodities. In this report, Kenneth Racke, the IUPAC representative on Codex, offers a brief summary and major highlights of the past meeting. The CCPR serves as a forum for discussion and decisions regarding aspects of MRL process risk management. Actual technical recommendations regarding MRLs and the acceptable daily intake (ADI) and acute reference dose (ARfD) toxicological endpoints arise from the annual Joint Meeting on Pesticide Residues (JMPR) of the Food and Agricultural Organization of the United Nations/World Health Organization (FAO/WHO). MRLs recommended by CCPR are subject to formal approval by the biennial Codex Alimentarius Commission (CAC) as Codex MRLs.

by Kenneth D. Racke

Big Group, Small Steps

Two-hundred-fifty delegates representing 51 countries and 15 international organizations attended but, as is typical, achieved few definitive outcomes or concrete decisions. The CCPR enthusiastically debates particular topics and position papers, appoints working groups to prepare new or revised position papers for future discussion, and refers technical matters to the JMPR for learned consideration. Eventually, the CCPR recommends finalized policies and MRLs that have proceeded through an eight-step process to formal adoption by the CAC.

In addition to the frequent interventions of national delegations, opinions aplenty were forthcoming from the manufacturers' representative, CropLife International, and the self-appointed committee conscience, Consumers International. With CropLife International anxious to see reasonable and pragmatic progress in promulgation of MRLs and Consumers International most concerned that the precautionary principle be observed with every action, these delegations found little common ground.

Referrals from CAC and JMPR

Acting on an early agenda item, the committee initiated a comprehensive review of the standard-setting and technical-evaluation processes employed by all Codex-sponsored bodies, including that of CCPR and JMPR. An independent panel of experts' report will be available for discussion at the July 2003 CAC meeting and could yield recommendations for process changes or further study. Included in the ongoing review will be an overall consideration of harmonized approaches across all Codex bodies toward food standards establishment and the associated risk analysis and management.

Several general considerations from the 2001 JMPR were briefly discussed. Among them, the WHO will be developing a guidance document on ARfD establishment. A pilot program for sharing chemical reviews from national regulatory authorities with the JMPR will be advanced later. The JMPR also noted impending availability of a new guidance document, "FAO Plant

Production and Protection Paper 170," on the submission and evaluation of pesticide residue data for MRL estimation.

Protection of Infants and Children

The Consumers International delegation requested that CCPR give further consideration to special MRLs for processed commodities such as infant formula and cereals. Back in 2000, the CCPR debated the need for default MRLs for those commodities and concluded that no such initiative was warranted since children were already well protected by the current MRL-setting process. The CCPR had recommended that food preparation methods be generally practiced that best minimize pesticide residue carryover. The CCPR recommendation to the Codex Committee on Nutrition and Foods for Special Dietary Uses for adoption of such language had been debated and supported. So, the committee decided that reconsideration was fruitless and inimical to progress in MRL setting.

Acute Dietary Intake Assessment

For the past couple of years, JMPR has undertaken to establish ARfDs and conduct acute dietary intake (ADI) assessments on a commodity-by-commodity basis using a simple, deterministic calculation. Short-term intake calculations are resulting in a significant number of cautions being raised which are blocking advancements of MRLs for approximately half of the pesticides examined. This stands in opposition to long-term dietary intake assessment, which infrequently is observed to exceed the ADI. The WHO's Dr. Jerry Moy shared example calculations for the organophosphorus (OP) insecticide disulfoton and highlighted his reliance for large-portion size estimates on the data matrix he has constructed to reflect the highest intake for each commodity at the 97.5 percentile reported from any single country. He reported that the delegation from South Africa had just supplied data which would increase the highest maize grain intake by some 25-fold. Based on that new data, the committee agreed with Dr. Moy's suggestion that all past short-term intake assessments for maize be recalculated.

A discussion of probabilistic ADI assessment followed, based on the paper prepared by the USA in cooperation with the Netherlands, Australia, CropLife International, and Consumers International. The paper highlighted the probabilistic assessment methodology employed by the U.S. Environmental Protection Agency and—while emphasizing the refined nature of such an approach in providing the most accurate reflection of the likelihood of any particular exposure across all crop commodities—also reflected its data-intensive nature. The majority of delegations were pessimistic about the utility of such an approach in light of the scarcity of data distributions at the international level on large-portion size consumption and limited JMPR technical resources. Germany also indicated that significant policy decisions would also be required, citing the selection of reference level as a particularly thorny issue. Based on the interest but lack of firm support, the committee referred the matter to JMPR for a technical opinion and will await the outcome of the general evaluation of risk assessment approaches planned as part of the ongoing CAC review process.

Regarding refinement of the currently employed methodology for acute dietary intake assessment, the committee noted a nearly completed IUPAC project (see

The Codex Committee on Pesticide Residues considers international standards for maximum residue levels of pesticides on internationally traded agricultural commodities, such as oranges.

www.iupac.org/projects/1999/1999-009-1-600.html), agreed to consider advancements in acute dietary assessment calculations, and appointed the Netherlands to work with IUPAC and several other delegations to bring specific discussions forward for the 2003 CCPR meeting.

Cumulative Dietary Intake Assessment

At earlier CCPR meetings, the committee expressed an intention to take into consideration the cumulative intake of dietary pesticides that share a common toxicity mechanism. The USA delegation presented a paper outlining the current approach being pioneered by the U.S. EPA with the OP class of insecticides. The USA delegation noted the preliminary nature of methods for such an assessment, but projected finalization of a first example by mid-2002. A few delegations noted the importance and desirability of including such considerations at the international level, but there were considerable reservations expressed for such an approach based on the complexity and data-rich nature of such methodology. Several delegations also noted the prerequisite of developing a probabilistic methodology before such cumulative intake assessments could be considered. The committee agreed that, given the immature nature of cumulative assessment approaches at even the national level, it was too early for CCPR to undertake any actions related to cumulative dietary intake assessment.

Criteria for Prioritization

The criteria employed by CCPR in prioritizing new chemical evaluations and periodic reevaluations of existing chemicals were debated based on a paper presented by the Australian delegation. The need for prioritization is driven by JMPR overcapacity in handling a significant backlog of technical evaluation requests. As a general principle, the committee agreed to maintain a 50:50 ratio between new and existing chemical evaluations. With the assumption that candidate products must give rise to residues in food commodities moving in international trade and which may give rise to public health concerns and/or impediments to trade, CCPR agreed once again that when establishing priorities, preference be given to those chemicals:

- the intake and/or toxicity profile of which indicate a high level of public concern
- that are new and safer and have the potential to replace existing chemicals that present a public health concern on which national reviews are available
- that may be responsible for actual or potential losses owing to trade disruption

The USA delegation, Consumer's International, and a few other delegations supported making the "safer" or "reduced risk" pesticide prioritization criterion broader in scope than just "public health" to include descriptions such as "reduced environmental impact," "safer for applicators," and "replacement of ozone depleter." The committee agreed that such factors could be taken into account in prioritization, but that they were secondary to public health considerations and likely already being taken into account when nominating "reduced risk" pesticides for CCPR prioritization.

Tentative JMPR Schedule

The Australian delegation also presented the report of the Ad Hoc Working Group on the Establishment of Codex Priority Lists of Pesticides. The committee accepted the report with several modifications related to agenda items that came up during the CCPR meeting. Of particular interest were the new chemical toxicological (T) and residue chemistry (R) evaluations scheduled for future JMPR meetings:

- 2002 JMPR: esfenvalerate (T,R), flutolanil (T,R), imidacloprid (R)
- 2003 JMPR: cyprodinil (T,R), famoxadone (T,R), methoxyfenozide (T,R), pyraclostrobin (T,R)
- 2004 JMPR: fludioxinil (T,R), zeta-/alpha-cypermethrin (T,R), trifloxystrobin (T,R)
- 2005 JMPR: dimethenamid-P (T,R), fenhexamid (T,R), indoxacarb (T,R), novaluron (T,R)

Accelerating the Codex MRL Process

A report focused on the Codex MRL process refinement and acceleration provoked considerable discussion. Unfortunately, the committee agreed on few practical steps and a move toward acceleration appears likely to

proceed at an agonizingly slow pace. The bulk of the discussion centered around a paper introduced by the USA delegation that focused on options for solving the "window of vulnerability" in trade resulting from the extensive time required to establish Codex MRLs. The process from new compound nomination for MRLs to promulgation of those MRLs may take four or more years. The paper highlighted eight practical suggestions, which ranged from simple, no-cost administrative changes such as holding the JMPR three months earlier so that first CCPR discussion can occur the next year, to extensive and costly program overhauls such as replacing the volunteer JMPR with a full-time technical evaluation staff. Projected process savings ranged from one to six years.

One idea that attracted much discussion was the establishment of "interim Codex MRLs" based on early adoption of the JMPR evaluations or reference to national evaluations and MRLs. Although a number of delegations supported serious consideration of such options, others were concerned about the need for caution and additional procedural safeguards. The only points of consensus emerging included the preparation of yet another paper for further discussion at the 2003 CCPR meeting and for CCPR to review MRL proposals at Step 3 the year following the JMPR meeting instead of automatically postponing by another year.

MRLs for Minor Crops

A paper prepared by the Spice Trade Association and introduced by the South Africa delegation, which highlighted the problem of MRLs for dried spices, also prompted discussion. Many of these products come from small farms in developing countries lacking adequate description of good agricultural practice in the use of pesticides and supervised field residue trials. Given the generally limited dietary intake of such commodities, it was proposed to base Codex MRLs and extraneous maximum residue limits (EMRLs) on available monitoring data as long as several criteria were met, including per capita consumption <0.5% of regional diets, substantial trade involvement, and availability of ongoing residue monitoring data from the producing country. The committee agreed to ask JMPR to establish guidance on monitoring data submission and also to have South Africa prepare a paper for discussion at the 2003 CCPR providing a definition and listing of candidate spices. The committee noted that current considerations be restricted to spices and not include tea, fresh herbs, or tropical fruits—all minor crops with similar MRL problems to spices. Future discussion on these leftover points is anticipated, and a recently initiated IUPAC project dealing with international chemistry and regulatory aspects for minor crops should also provide additional guidance (see www.iupac.org/projects/2001/2001-039-1-600.html).

OPs and Carbamates

Some of the more acutely toxic OP and carbamate insecticides were the subject of CCPR discussions and actions. Due to implementation of the periodic reevaluation process and acute dietary intake assessment, a number of Codex MRLs for these insecticides are being put on hold or being revoked based on inadequate numbers of residue trials, especially for minor crops, and short-term intake concerns. Most or all MRLs are being revoked for bendiocarb, fenitrothion, fenthion, mebarbam, mevinphos, monocrotophos, parathion, and phosphamidon. A significant number of MRLs are being stalled or revoked for aldicarb, carbofuran, diazinon, dimethoate, methamidaphos, methomyl, parathion-methyl, phosalone, and phosmet.

EMRLs

In addition to MRLs based on approved uses, CCPR has also established EMRLs for compounds no longer used, but for which inadvertent contamination of food commodities may occur. There are a number of EMRLs for DDT (21), and the 1996 JMPR had recommended revised values for mammal meat and poultry products based on available monitoring data and projected frequency of noncompliance rates for commodity shipments. The CAC had considered decreased EMRLs for meat during 2001 based on a CCPR proposal, but could not reach consensus. The committee agreed to indefinitely shelve the revised meat MRL proposal for DDT, but would in the future determine availability of new monitoring data to support future discussions. However, a proposed poultry meat MRL advanced to Step 5 for future consideration. The 1996 JMPR had concluded no dietary intake concerns would result from the existing or revised EMRLs. Although the Canada delegation indicated that a national intake assessment had flagged short-term intake concerns for children, the Netherlands delegation reported that short-term dietary intake was estimated at 14% of the ARfD for children based on a recent assessment. Canada tends to adopt additional uncertainty factors based on endocrine-disruption concerns.

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www.codexalimentarius.net/ccpr34/pr02_01e.html