Hands-On Food and Water Rapid Test Workshop Called a Success

In response to food and water testing challenges posed by globalization, the AOAC Pacific Northwest Section held, on June 15–17, a Rapid Test Workshop addressing natural toxins and selected antibiotics. Led by James Hungerford, U.S. Food and Drug Administration and chair-elect of the Section, the workshop leveraged instruction from members of the Marine and Freshwater Toxins Task Force, hands-on demonstrations by many of the leading test kit vendors, and also included in-kind sponsorship by the Washington State Public Health Laboratory (WPL). The workshop was held in conjunction with the 28th Annual Meeting of the AOAC Pacific Northwest Section (*see* page 12).

Called a success by participants, the workshop aimed to:

- Familiarize attendees with enzyme-linked immunosorbent assay (ELISA) technologies and a variety of rapid assays including lateral flow immunochromatography (LFIC)
- Provide training on microplate techniques and evaluation of results
- Show emerging field instrumentation
- Encourage validation efforts on rapid tests
- Discuss rapid testing capabilities and stakeholder needs

Toxins and Other Contaminants

Toxins and other contaminants covered were not restricted to phycotoxins, and the ELISAs and LFIC kits included those for histamine, paralytic shellfish toxins, domoic acid, okadaic acids, microcystins, deoxynivalenol, ochratoxins,

The Rapid Test Workshop was an international event, with attendees from North America, Europe, and Africa; demonstrations and instructors from AgResearch of New Zealand, U.S. government agencies, University of Washington, and Sandia National Laboratory; and North American and European kit vendors. Hosting the event were Romesh Gautom and Shelley Lankford of the Washington State Public Laboratory.

aflatoxins, chloramphenicol, and fluoroquinolones, among others. Rather than choosing a narrow application area (as required to include top-to-bottom procedures like sample extraction), the workshop emphasized the flexibility, technology, and growing numbers of ELISAs and test strips now available for contemporary global trade-relevant contaminants. The workshop also touched on developments in portable instrumentation. To the extent possible, given time constraints, target analytes were chosen based on recommendations from the U.S. Food and Drug Administration (FDA), U.S. Environmental Protection Agency (EPA), U.S. Department of Agriculture (USDA), and the AOAC Chemical Contaminants and Residues in Food Analytical Community.

An international event, the workshop hosted private food and water testing laboratories; state and federal government analysts; and researchers from North America, Europe, and Africa as experts examined food and water testing and cutting-edge portable instruments. The opening lectures, by James Sinclair of EPA and James Hungerford and Stacey Etheridge of FDA, described testing needs. A presentation by Clement Furlong, University of Washington's (UW) School of Medicine, described the capabilities of the first portable surface plasmon resonance (SPR) sensor. Victoria VanderNoot of Sandia National Laboratory introduced the laboratory-on-a-chip instrument, called the Unattended Water Sensor. Both instruments are capable of extremely versatile detection schemes for analytes ranging from routine contaminants to natural toxins, viruses, and bioterror agents.

Participants worked hands-on with a variety of LFIC field tests or other rapid formats and ELISAs covering selected antibiotics and natural toxins.

Lead workshop instructor Lyn Briggs of New Zealand's AgResearch Institute highlighted the principles of ELISA, including detailed advice on safety, avoiding cross-contamination, and maximizing results. This presentation helped to prepare about 36 workshop registrants for the next 2 days of laboratory sessions.

Laboratory Sessions

The laboratory sessions were structured to encourage individualized training, with a maximum of 18 students in the laboratory at any given time. Four microplate readers were available at all times, provided and overseen by Abraxis, R-Biopharm, and Neogen.

The first day of the laboratory session emphasized technique. Following a detailed walk-through of an example ELISA, participants then had the opportunity to demonstrate and improve their own laboratory techniques and skills. Pipeting dilute solutions of dye for this exercise, followed by microplate readings of the results, gave students valuable feedback on consistency. Indeed, the session proved a highly valued aspect of the workshop.

Hands-On with Test Kits

Participants worked hands-on with a variety of LFIC field tests or other rapid formats and ELISAs covering selected antibiotics and natural toxins. In addition to Briggs, expert instruction was provided by the kit vendors and by Mark Poli of USAMRIID and Etheridge. Rick Stevens and Scott Soeberg (UW), and VanderNoot demonstrated the next generation MicroTAS and portable SPR solutions.

Vendor participants in the workshop included Abraxis, Jellett Rapid Testing, Neogen, Rocky Mountain Diagnostics, and R-Biopharm. Pickering, a postcolumn liquid chromatography (LC) vendor, and Biosense of Norway were also workshop sponsors.

Pacific Northwest Section Meeting Option

The workshop segued into the AOAC Pacific Northwest Section Annual Meeting at the University of Puget Sound, held June 18–19. The Section meeting included many topics of interest to workshop attendees, especially in the seafood/marine toxin areas. Workshop-relevant keynote and seminar presentations included actual development of ELISAs, analysis following a paralytic shellfish poisoning outbreak, portable and field platforms for toxin detection, experiences with cyanotoxins testing, phycotoxin ELISAs, postcolumn LC method for saxitoxins, comparisons of multiple saxitoxin-testing methods, and immunochemical detection of saxitoxin in body fluids, among others.

Conclusion

Feedback from workshop attendees has been positive. Future workshops will focus on a specific group of contaminants and toxins. In addition to exploring new kits, the workshop will address challenges encountered in field testing, extraction, and other sample manipulation issues, tentatively with a seafood focus. For more information on both the Pacific Northwest Section Annual Meeting and future workshops, visit the Section Web site at http://www.aoacpacnw.com, and the Marine and Freshwater Toxins site at http://www.aoac.org/marine_toxins/task_force.htm. ■

Inclusion and/or mention of test kit vendors and their products does not constitute an endorsement of their products by AOAC INTERNATIONAL, FDA, EPA, or USDA.