

FSRC Food Safety Information Infrastructure Project: Phase 1
**Workshop on Research Community's Role in Collection,
Access and Sharing of Food Safety Information**
Baltimore, Maryland | February 1, 2007

Summary of Key Ideas

DISCUSSION DRAFT: March 14, 2007

NOTE: This list of ideas was drawn from presentations and discussions at the February 1 Food Safety Information Infrastructure (FSII) workshop, and is intended for solely for discussion purposes. It does not express relative priority or level of support among participants. It is not intended as a consensus document. Comments are not attributed to specific individuals.

SESSION 1:

The food safety research agenda: What is the role of the research community in the food safety information infrastructure?

Presentation:

Bob Buchanan, FDA/CFSAN -- *Regulatory Perspective*

Notes from discussion (the following are not attributable to the presenter, but are summarized conclusions that include notes on the presentation and comments from other participants):

- Regulatory agencies use research to fulfill their missions with two needs: knowledge, and data
- Application of laws is based on scientific judgment and data, which enters in many ways:
 - o Numerous regulatory programs and responsibilities: assessment of individual firms, development of food safety policies, development of guidance, emergency response, etc.
 - o Numerous areas of research/data needs: hazard characterization, analytical methods, risk assessment, intervention technologies, surveillance, status of industry, human behavior, etc.
 - o Numerous disciplines: microbiology/molecular biology, chemistry, medical sciences, food science, toxicology, epidemiology, applied mathematics/statistics, psychology, education, etc.
- Sources of research or data: "anywhere we can get it" – intramural (currently, ~ 25% of FTE), extramural, leveraging (interagency, consortia/collaborations, international), industry, inspectional surveillance, public health surveillance/statistics, investigational data
- Numerous challenges for regulators to acquire the necessary knowledge and data:
 - o Complexity of food system:
 - Diverse and changing industry (size/continually changing)
 - Diversity of consumers (ethnic groups, cultures, those new to cooking)
 - Diversity of products & ingredients
 - Farm to fork scope
 - Globalization
 - o Diversity of data collection methods (how many PCR methods do we need? We need matrix extension, we need to modify the method to other commodities, to test ruggedness/repeatability, technology transfer & education... problem is it's a competitive business)
 - o Timeliness of response
 - o Episodic nature (emerging pathogens)
 - o Tools to integrate information/data into meaningful picture

- Task-forces are used to develop research agendas – FDA has inter-agency basis for acrylamides, E. sakazakii – it’s a complicated question because we have numerous factors that drive whether we need methods, more data, which all might depend on industry makeup – big difference between big mature industries and orphan industries with no major players
- There may be conflicting or competing guidelines between agencies: e.g.: environmental agencies may want wildlife near farms, but the opposite may be optimal from a food safety standpoint

Presentation:

Dave Gombas, United Fresh Produce Association -- *Industry Perspective*

Notes from discussion (the following are not attributable to the presenter, but are summarized conclusions that include notes on the presentation and comments from other participants):

- Motivations for and types of research performed by food industry
 - o Objective driven: for compliance, to achieve competitive edge
 - o Short term (1 experiment – 1 year): to assess specific products or processes for potential hazards and prevention, control, and elimination of hazards – validate safe conditions & determine range of safe/unsafe conditions
 - o Long term (6 months – ongoing): to identify new processes or improvements over current (as basic as it gets), and to demonstrate process control: routine monitoring, verification tests
- Numerous obstacles to sharing industry research and data
 - o Data may be misunderstood/misleading without context of experimental conditions
 - o Data and conditions may be proprietary assets (competitive value)
 - o Time & costs – designing for sharing may incur costs, processing and sharing data may be expensive – ultimately, what is the return on investment?
 - o Liability issues/ legal or business ramifications
- There are some reasons for sharing industry research
 - o To influence food safety policies of regulators or customers, as direct inputs into policy development process, or indirectly by affecting the debate
 - o At the start, the government may not have data and starts to gather it, and at some point, it has enough information to act; at that point, it becomes within industry’s interest to provide better data to avoid overly strict standards
 - o To protect market share (generally, this is within industry, not with others outside industry)
 - o Publications or peer review may serve to validate a process that may need approval

Presentation:

John Sofos, Colorado State University -- *Academic Perspective*

Notes from discussion (the following are not attributable to the presenter, but are summarized conclusions that include notes on the presentation and comments from other participants):

- Academic research is broad and complex, defined by numerous reasons, audiences, and disciplines:
 - o Reasons: to provide scientific knowledge, to help provide solutions or address issue of public concern, or to educate and to train new scientists
 - o Numerous audiences: researchers, industry, regulators, public health community, consumers
 - o Disciplines: natural sciences, food science, agriculture, math, social sciences, etc.
- Information from academic research usually shared through publications and presentations:
 - o Journal articles
 - o Other publications: reports, white papers, theses/dissertations, trade magazines, books, etc
 - o Conference and professional presentations

- Education and Extension efforts: training programs, workshops, classroom
- Web pages
- There are usually few restrictions on sharing academic data/information
- The primary academic agenda is “follow the money” - money may become available due to state, national, or international needs, public health developments/trends, or outbreaks & emergencies
- The academic research agenda is influenced by a large number of factors:
 - Emerging public health issues or industry concerns
 - Advances in science, technology, or other fields
 - Goals of associations, firms, funding agencies
 - Regulatory action or potential action
 - Scientific curiosity and individual research interests
- Academic research agenda is uncoordinated & could use better long-range planning, more collaboration, greater use of past findings to guide a sequence of research, use of risk assessments and similar approaches to identify most important data needs
- Individual creativity and academic freedom are strengths of the system, resulting in a diversity of research and viewpoints, though this is at odds with a coordinated agenda
- Some academic research is duplicative because feds and industry don't publish
- Academic research has a long pipeline – typically a 5 year window (6 months from need to RFP, months for competition, 2-3 year is short term project, plus 2 years for peer review & publication)
 - Under certain circumstances, there may be shorter term projects funded by industry
 - Delays in funding academic research is a major reason for intramural research in government, and for consortia and collaborations to get quick turnaround with partners
- Difficulties finding and keeping the best students
 - Students are hired away
 - This is partially a timing problem; you find out in May/June that you've got the money, but the time when students are looking for post-docs is April – Are there opportunities to change the timing of CSREES?
- High overheads are difficulty for industry funding research (it's a problem when 50% is taken off the top for administrative costs)
- Information and publication overload and under-use

Discussion:

- Collaboration between academia and industry is important but problematic:
 - Inadequate industry participation and openness – we are accused of not living in the real world, but we need industry to tell us what the real world looks like
 - There is an open issue with academic research involving industry because of the repercussions of finding a positive – what do I do when I find a positive? Do I contact the regulators? There's a need for blinding, which is where industry associations come in
- The increase in requests for collaborations (in RFPs) causes a great burden on the proposal-writer – it takes a lot of time and effort to build up collaborations; this means that proposals are getting more and more difficult to put together in very short time windows.
- The difficulty in transferring money between universities is worse than from government to university
- Coordination is a major concern with the overall research agenda:
 - What is lacking is a mechanism to tie it all together – there may be 6 projects looking at the same issue, do they ever talk to each other?
 - What is lacking is the mechanism to start out and see what we know and decide what is needed so we don't have 6 competing projects doing the same thing

- The ARS process involves public workshops for feedback/input into the long-term action plan
 - o ARS then asks for intramural proposals (reviewed externally) towards these goals
 - o Responsibility to be flexible and change the research to reflect real-world (e.g. following spinach outbreak, refocus of some researchers)
 - o Can't do baseline projects, but can contract out some work to universities
 - o ARS should be responsive to needs of industry, but primary stakeholders are FSIS and FDA
 - o ARS has annual internal food safety budget of ~ \$100M and gets \$4-\$10 M externally
- It is worth doing retrospective studies to see which the most important and/or effective studies were to see if we can learn from past research – if you look at E. coli you see this exponential ramp up in research, but which studies were most pivotal? The most useful may be the most transferable.
- CSREES hasn't traditionally funded baseline studies, but if you look at produce, there is such a huge gap in baseline data and on persistence in the environment that this should be rethought
- CSREES agenda is set through formal and informal processes, but mostly through stakeholder input
 - o ARS is doing a lot and federal agencies are doing a lot, but this should drive the process
 - o The driving responsibility has to be to represent all of us
- We need to find a way to come up with goals and an agenda as a collective:
 - o The food safety community lacks a single association to focus the agenda, unlike the National Heart & Lung Association for example, which has committees that define objectives, and put together public awareness campaigns – the food safety community isn't good about stating the collective case or generating the necessary funds
 - o It can be very difficult to collectively agree on priorities – e.g. nternal meetings to communicate feedback to ARS on our priorities, and the joke was – what ISN'T in there? Everybody has their own priority, and you end up with a huge list of topics – Going beyond that to identify the top 3 or 4 is really difficult.
 - o There are some groups within the food safety community that do define priorities and come up with collective agendas (e.g. NIFA within USDA)
 - o Public campaigns can do as much harm as good – For example, all the efforts that have gone into acrylamides, which is really a minor public health issue, was due to this sort of thing. Same with alar. We have to be careful with courting this sort of approach. A public campaign can be hijacked by a single agenda.
 - o We need a framework for prioritizing research
 - o We need a continuous ongoing process – we tend to prioritize once and lock in even as reality changes around us.

SESSION 2:

Data needs of the food safety research community

Presentation:

Julie Caswell, University of Massachusetts -- *Research Community Perspective*

Notes from discussion (the following are not attributable to the presenter, but are summarized conclusions that include notes on the presentation and comments from other participants):

- Major problem is knowing what data or research have already been done
- One example of identifying data needs might be multi-criteria risk management
 - o Imagine a cube of multiple dimensions, each cell is a piece of information
 - Food dimension (e.g. beef, poultry, dairy, produce, etc)
 - Hazard dimension (e.g. E. coli O157:H7, Salmonella spp., etc.)

- Factor dimension(s): Public health impacts, Social sensitivity variables, Market level impacts, Consumer risk perceptions
 - As an organizing principle, this kind of disciplined organization of what we do know might allow us to avoid overlapping research/needs or to notice similarities between different cells
 - Might have a similar cube for industry – different factors but similar organizing principle
- Informed risk-management requires the ability to compare costs of an action or intervention with the impacts of that action or intervention. This leaves data gaps in the areas of:
 - Estimating impacts of interventions:
 - Reduction in public health outcomes (e.g. illnesses)
 - Valuation of health impacts in dollars and QALYs
 - Indirect benefit dimensions: changed consumer perceptions, market impacts, response to social sensitivity
 - Accounting for costs of interventions:
 - Direct costs to government, industry, and/or consumers
 - Indirect costs due to market impacts
- It may be possible to create ex-ante standards for data collection, so that data is collected in a structured manner that makes it more useful for analysis:
 - Who's job to do that? It couldn't be government, perhaps a body such as NAS
 - In the Behavioral Risk Factor Surveillance System (BFRSS), if going to ask a certain type of question, encouraged to use a specific question to ensure comparability
 - For clinical trials, you can't publish unless you enter the trial in a clinical trials database in advance of the trial, and meet specified conditions/standards
 - If there are going to be standards for how data is collected, the standards have to be driven from the top-down; they have to be initiated at the front end as conditions of funding or on the back-end as conditions of journal publication.
 - There are some examples where researchers have come to agreement – the international burden of disease group is a volunteer group where the group has specified that if you are going to publish burden of illness studies, you should include at least 12 specific variables.
- Data transparency and availability
 - Some data can be used in multiple contexts
 - Some research might not happen because data isn't shared, but the opposite might also be true – duplicate research is done because data isn't shared
 - There are timing concerns: when do you make the data available? Do you put it up at the end or as you go along? If you put it up early, someone else might try to publish it, so this results in delaying data availability until publishing is well under way
 - Would CSREES fund a meta-analysis type of project that would identify incompatibilities that would identify what kinds of aggregations are feasible? How do you fund long-term undertakings with competitive grants?
- One option for improvement might be a clearinghouse website that could collect data sets and serve as a repository for data corresponding to journal articles...

Presentation:

Jan Singleton, USDA CSREES -- NIFSI Perspective

Notes from discussion (the following are not attributable to the presenter, but are summarized conclusions that include notes on the presentation and comments from other participants):

- For CSREES, a big difficulty is to demonstrate the impact of funding programs – each researcher must answer: what are you doing? Can you prove you are doing it? Is there duplication?
 - Performance-based budgeting

- Set benchmarks for short, medium, and long term goals and objectives
- The reporting dilemma for NIFSI is that the applied research promotes behavioral change to reduce incidence of disease, but how do you measure behavioral impacts? What behaviors do you measure? How do you move from measuring behavioral change to measuring reduction in illness?
- Reporting issues in CSREES
 - NIFSI reporting statistics show that although most researchers have submitted descriptive information on impact, fewer than 10% have submitted behavioral data
 - CRIS, the reporting system for CSREES, collects impact data, but it is a hard-wired system that can't easily be changed and without the ability to capture extension or education data
 - CRIS is run by a special office within USDA and is essentially untouchable
 - If we can't easily measure impacts, and we can't easily track those we try to measure, how can we tell whether NIFSI has made a difference?
 - One issue with reporting impact to CSREES is that if you have publications after you file your final report, the file is closed and you can't update it. Also, if it's an integrated project, if the lead researcher's name isn't on it, the publication can't go into the final report
- How can we improve impact reporting in CSREES?
 - Reporting within CRIS should be strengthened
 - Some standardized data across the program should be collected – how do you develop standardized measures?
 - Some actual impact indicators should be developed
 - More quantitative data should be aggregated across the program
- ARS uses ARIS not CRIS, but not even the National Program Leader has access to it – only the program assistants can actually get in there; we have to pull out a lot of information, summarize it, and so on, but otherwise, nobody outside ARS can see what we're doing.
- Measuring impact of research:
 - It may be unrealistic to try to use public health data to try to justify a food safety research or regulatory program. It's like trying to pick up a penny w/ a hammer – most public health data is highly confounded and its' difficult to attribute cause and effect
 - Descriptive reported impacts may be quite useful because they at least measure what can easily be measured, rather than a pseudo-scientific approach to try to quantify things
 - There are approaches to measure effectiveness, but these things are resource intensive and expensive, and often involve surveys, human subjects, etc, so it's often not worth all the effort
 - How much money do you have to put into evaluation? Our instruments are so blunt
 - We need to keep measures of effectiveness simple, and they can't be based on public health surveillance done by CDC – you can't make yourself dependent on another agency like that
 - At the end of the day, Congress wants to know that for \$1 of investment, they got \$3 in return

Presentation:

Chris Wozniak, USDA CSREES -- NRI Perspective

Notes from discussion (the following are not attributable to the presenter, but are summarized conclusions that include notes on the presentation and comments from other participants):

- Setting priorities in CSREES NRI requests for proposals:
 - To define priorities, we might consider morbidity, mortality, hospitalizations, economic impact, product recall frequencies to give us quantifiable information
 - CSREES is the only source of funding for certain research areas: if CSREES stops funding these for a time, maybe 8-10 years, what will the researchers in those areas do? Who will maintain the training regime?
 - What the priorities should be is very subjective and it depends on who you talk to

- Decreasing the number of priorities listed in an RFP will result in fewer proposals, but will increase odds of winning for any individual proposal
 - o Will a more focused RFA generate greater dividends in the long run?
 - o There may be value to a narrower focus as it gives agencies targets to hit, and can spur innovation and change – e.g. O157 in beef
 - o When O157 in beef was pulled from the 2007 NRI because illnesses have met the 2010 benchmarks, we got very supportive as well as very angry emails
 - o But what if NRI doesn't fund something for 8-10 years, such as toxoplasma, what will researchers in those areas do?
 - o Norovirus is an example, where people say we need more data, but the numbers haven't changed in years, and the number of deaths is still low
- Pros and cons to dynamic and changing priorities: on the one hand, we need to be responsive to emerging problems, on the other, it means less opportunities for researchers to improve upon and re-submit proposals from previous years
- The research community needs many kinds of statistics and metrics including public health estimates (outbreaks, incidence, hospitalizations, mortality), economic impacts, product recalls, regulatory changes, performance of new mitigation technologies and diagnostics, emerging pathogen issues, antibiotic resistance information, changes in agronomic practices, persistence or selection, etc
- Data sets are available for many of the most important pathogens, but are incomplete relative to being able to set research priorities with certainty.
- Some NGO and government sites do a nice job with the primary pathogens of interest.
- Lack of accurate data for some agents reflects a difficulty in diagnostics and identification (e.g., caliciviruses) as well as reporting by medical personnel.
- What are the constraints on the research community:
 - o Proprietary information;
 - o Breadth and volume of data;
 - o Inadequate recording of what would generally be considered as 'negative' data;
 - o Publication forum / journal choice;
 - o Lack of funding for adequate collection, analysis and publication of data sets
- Opportunities for improvement
 - o If we had funding, a common website to find out what is available and can be disclosed, with rapid publication of data sets, news of emerging outbreaks, new diagnostics and regulation – If nothing else, links to places on the web to find what is new and relevant
 - o Ensure an understanding of what is currently available and how to access it.
 - o Increased networking between Federal, State, County, University and Industry partners.
- Two systems for data collection
 - o Food Safety Research and Response Network (FSRRN) are in the process of establishing a database that will collect samples from on-going projects (that can be shared). It will have the samples as well as epidemiologic data already collected.
 - o The Inter-agency Federal Risk Assessment Consortium and linked website (FoodRisk.org) collects data and risk assessments so that different researchers can get access and do their own, but most people won't share their data.

Discussion:

- The most critical information is good surveillance knowledge – different surveillance systems or time windows result in different conclusions
 - o This difference between active surveillance and outbreaks is important because the outbreaks drive the public perception and attention

- Listeria is a good example: case control studies suggest FDA products but outbreaks and other data suggest meat and poultry
- Data collection can be affected by disciplinary biases and lock-in – the numbers of biologists, virologists, and parasitologists affects what we focus on
 - The agencies due keep some low level of activity on “orphan” pathogens (e.g. Staph aureus) because of the capacity for an outbreak or event
- We need research not on which pathogens are the most common, but on those with knowledge gaps – example: C perfringens is common, but we don’t do much research because it’s mostly an implementation issue, and in beef, we increasingly know what we have to do, but with water and produce, we lack basic knowledge
- We lack knowledge on “fundamental” human behavior – e.g. how do people balance risk, nutrition, and costs? How do food service workers think about food safety? NIH doesn’t fund these kinds of research, they say go to CSREES, but it isn’t in there either
 - NIH doesn’t care about food safety – they fund basic science & treatment, not prevention
 - We have moved away from behavioral science
- If we don’t keep things on the research agenda, things come and go and we can lose expertise – for example, botulism
- Are there pathogens we are not collecting?
 - We collect O157 but we don’t collect all the EHECs at the same level
 - CSTE works on this issue and is open to suggestions – the O157 issue, for example, was raised and approved, and it’s in progress
 - Listeria is an ongoing issue – we have good data in places, but not in 1st or 2nd trimester
 - Women call us (S.T.O.P) all the time with questions about Lm, they read a story similar to theirs (miscarriage, symptoms), and they want to know why they weren’t told about it – since the research is still uncertain, there’s not much we can do

SESSION 3:

Accessibility and timeliness of data generated by the research community

Presentation:

John Sofos, Colorado State University -- *Timeliness and Access*

Notes from discussion (the following are not attributable to the presenter, but are summarized conclusions that include notes on the presentation and comments from other participants):

- Scientific publications are the primary means of sharing the results of research
- A valid publication is published in a quality peer-reviewed journal that is accessible and available without restriction and which provides a permanent record
- A scientific publication is the first publication of original research that:
 - Allows peers to evaluate premises and observations and to repeat and test conclusions
 - Satisfies obligation to make data and research public
 - Permanent record of research; Long-term accessibility
- Scientific publications also serve researcher by protecting intellectual property and influencing reputation, producing financial rewards, measuring productivity, and affecting promotion/tenure
- Peer review process guarantees quality of final results and provides trusted material for use by others
 - Peer review may also find errors in research and improve the document
- Peer review process is costly, time-consuming, and slow:

- Work overloads – a lot of effort required with other research/job requirements pulling
- Long turnarounds caused by lengthy complicated chain, unpaid reviewers, and the occasional intentional delay caused by a reviewer or editor
- Role of peer review as primary means of sharing information has resulted in Information overload with a large number of journals and exploding numbers of articles – JFP articles have more than doubled between 1994 and 2006 (194 to 430), page-count has nearly tripled (1138 to 3100)
- There are numerous ethical issues that play into the scientific publication process
 - Scientific fraud (plagiarism, data falsification, fabrication)
 - Conflicts of interest, reviewer integrity, authorship questions (who did the work?)
 - Authors rights, copyright - papers published in Journal of Food Protection become the property of JFP and IAFP, and no part of the publication may be shared/transmitted without consent of the Editor
 - Sensitivities: animal welfare, bio-safety, items of a sensitive nature (biosecurity)
 - Commercialism – not to be used for branded products or brand promotion
- A few publishing giants that control the majority of journals, with some important consequences:
 - Intellectual property protection and rights of scientists/authors put into question
 - Availability of information and increasing costs for access – some journal rates have gone up dramatically, which has made accessibility an issue
 - Should scientists be paid to publish? Or should they pay?
 - Recommendations by (UK) Publishers Association:
 - Guarantee public access to publicly funded research results shortly after publication
 - Aim at a level playing field in terms of business models in publishing
- Who should be in charge of journals? Commercial publishers or scientific “learned” societies?
- Who should pay the costs of publication? Pay the scientist or the scientist pays?
- Opportunities for improving the current publishing system:
 - Extended quality’ rankings of scientific journals
 - Guarantee perennial access to scholarly journal digital archives
 - Promote pro-competitive pricing strategies and scrutinize future significant mergers
 - Promote the development of electronic publications
 - Setting up an advisory committee
- Web/electronic publishing:
 - “Open access” to free online journals is increasingly championed as a less expensive alternative to print journals
 - Pros: may be faster and cheaper, provide instant access and increased audiences, allow for more creativity in presentation, and isn’t as limited by page-counts
 - Cons: may make it more difficult to apply intellectual property / copyright/republication laws, might restrict access due to loss of accessible print copies in libraries, impacts library structures (books versus I.T.), and faces significant concerns about long-term availability due to non-physical nature
 - How will it affect peer review? Can open refereeing or forum/chat sites perform similar or equal function as peer review?
- The 2006 Federal Research Public Access Act (FRPAA) - Eleven federal agencies funding research require grant recipients to publish their work, online and free, within six months of publication – similar to UK guidelines
- Web sites and e-journals may provide serve as journal publication data repositories: for example, JFP has begun to promote that authors of papers related to microbial responses to food environments submit their data and models to ComBase (www.combase.cc), a peer-reviewed open and freely accessible international database of such models created by USDA ARS, UK FSA, and others.

Discussion:

- The peer review process clearly plays an important role in research, but specifically, how valuable is this process to the sharing of food safety data used in decision making?
 - o Takes too much time; with the passage of DQA, we can exempt a peer review article, and any evaluation we publish must go through its own peer review process – so if we are using someone else's data that has already been peer reviewed, we may nonetheless have to pay \$1000 to \$5000 to have that work peer reviewed again by a contracted group
 - o There is 40-50% rejection of peer review (not counting resubmission), so there is an important quality-of-data function there
 - o A lot of data doesn't get published and then who reads those that do? It's professionals and peers only, so there is limited readership and limited range of sharing information
 - o There are other ways to publish, too – peer review is the process of quality assurance, and from there the extension and education efforts take over – the research is “converted” into knowledge more consumable by general public and non-scientific stakeholders
 - o Peer review is an obstacle to access – the value of the publication to the individual is so high that data is not shared until publication is assured or completed, and the delays mean that by the time the data is published, its value to others is diminished
 - o There are always lesser journals to publish work that won't pass muster at highest levels, so you can get the information out there
 - o There is a tradeoff between the “value added” functions and the utility of immediate access – the incentives to participate in peer review are disincentives to share information
 - o There have been many times when data do not pass scrutiny and just putting the table out there is misleading, and it should never see the light of day
 - o On the other hand, there are times when authors might misinterpret or exclude data or might need to examine data more closely – there is value to having the data out there for other folks to evaluate and use and to influence further research
 - There is a big difference between a dataset and the interpretation of that data
 - o If it is public data collected by taxpayer money, it has to be made available to people, warts and all – agencies hide behind peer review issues because they don't want to share
- Can we or why can't we publish data in advance of publishing an article?
 - o There are economic issues and value to the data that complicate the matter – for example, ERS has got a cut-rate price to get old grocery scanner data, but as part of this agreement, ERS can't share the data – researchers have to sign an agreement – you can't publish work based on this data because the agreement precludes sharing of data in peer review process
 - This move to proprietary data is a huge change and has profound impacts
 - o If you put the data out there before you're done with it, others can analyze it and publish on it, perhaps before you have a chance to do so – you've put a lot of effort into collecting the information and it is fair that you should have some right to be the first to analyze it
 - o Sometimes people are aware of data prior to peer review – the peer review process forces the author to think about how it fits into what else is out there in the literature
 - o Data quality is important – if I see an abstract and in 2 years I don't have a paper, I dismiss the abstract
- The scientific community is dramatically affected by the web, not only moving forwards, but looking backwards – today's graduate student relies totally on the web for finding information, but most journals don't have online archives back past 1996, so you see research that has been done before, some in the 1980s and even back into the 70s
 - o There isn't a researcher in the room who hasn't seen that – you get a reference list that doesn't go back past 1998.

- It may be possible to come up with cost and fee structures to create data repositories – in the population survey arena, we got the community together and created a repository that is free for consortia members or for a fee by others
 - o These things are not free – ComBase and PMP have thousands of databases and require a lot of money, investment, resources, time to maintain – we need to ask whether its worth it for each dataset
- Timeliness is a huge issue: the data/science is never there when regulators need it, but the regulator has to make a decision – we take uncertainty into account, but if the science decreases uncertainty and changes where the position should be (perhaps it is too cautionary), it is ridiculously difficult to change the position at that point
- Despite all our efforts, outbreaks and media are what get things done – the movement in produce due to O157 came 8 years to late – we need to know how we can make the regulatory agencies more proactive and less reactive – the question, from the consumer standpoint, is: why did it take that kind of attention following the outbreak to get the ball moving?
 - o FDA has been working on produce for a long time, at least since 1996, but things change
 - o But the public wasn't aware of FDA doing anything – it came out of the blue and now you see huge distrust of bagged salads still – if consumers were at least somewhat aware, they might not have overreacted
 - o There's so much we still don't know about produce, it's just a difficult problem
 - o It is complex, no doubt, but if people have been focused on it since 1996, that's ten years, and what has been prevented?
 - o We certainly have prevented outbreaks, but how do you measure that? And even if you could, it doesn't make the news.
 - o How do you keep abreast during rapid changing world – move to bagged salads, increasing amounts of salad consumed
 - o It's unfortunate that it happens this way, but things get done in a crisis

SESSION 3: Synthesis and Possible Next Steps

Discussion:

Let's go around the room and give people a chance to lay out any closing thoughts (the following have been grouped to provide greater coherence):

- Awareness of data and research gaps:
 - o Awareness is a profound concern, especially given the uncoordinated nature of research – even the most knowledgeable people in the field don't know what is going on out there\
 - o I would like to have greater access to information on past research – my scientists are not aware of what was done 20-30 years ago – there must be some way to improve access to old data and old journal articles
 - o I like the idea of capturing data and data gaps in something like the data-cube that was presented
 - o We should have greater access to what other research is going on there – to have something such as CRIS to make research easier to find out about – to open up ARIS more openly
 - o The federal government has a responsibility to at least know what research is going on out there – there are so many efforts even within the government of reducing gaps and identifying overlaps, the FSRIO was created to attempt to keep track of this, but it's difficult to track – it's a challenge, but perhaps we can come up with a more standardized process

- Funding is a critical issue here; we have limited resources available to do research and to share the results – we need to be wise about how we spend our money:
- Sustainability – going forward, this kind of thing has to be sustainable – who is going to fund a database over time? Who will keep it timely?
- Peer review:
 - o Peer review is an important but demanding process, but there is a lot of important data that does not require peer review to be helpful – we should try to find other ways to get this information out there
 - o We need to find creative ways to separate the data from the interpretation, so that moving forward we can make data available even while articles are in peer review – this may require finding ways to protect the “value” of the data for publishing purposes so that the original collector still has an incentive to share
 - o There is a benefit in the expectation or requirement that data will be posted onto commonly available sites in a reasonable format – if you have that expectation AS you publish or as you collect data, you will format your data in such a way to make getting it out there easier
- Industry would likely support a well-protected means of sharing their data if they could ensure that it would not be misused
 - o Member companies of ILSI feel that they have to work on their own improvements to published methods to get them to work for their specific products and processes, and this information would be very useful to share
 - o There are historical data sharing successes where industry has shared the results of research with regulators: Listeria, acrylamides, etc
 - o We might consider a forum for bringing together these different sectors for a continuous review of available data
- We need to know what makes an effective intervention.
 - o What motivates behavior change?
 - o How do you tailor an intervention to the target audience?
 - o What if it is a high risk audience? How much of increase in foodborne illness is due to increase in risky populations?
 - o How do you truly evaluate impact of intervention program?
- Standardization:
 - o I'm a pragmatist, we're never going to standardize everything, need some practical methods for aggregating data, weighting data based on quality, and conditioning data – we need to get smart informatics folks engaged on these issues
 - o We need to be able to combine data, but I'm more optimistic – I think we can build a body of data that is more useful – we should be working towards standardization
- Prioritization of research efforts
 - o CSREES is open to input
 - o We need to ask ourselves: what question is it we are trying to answer?
 - o We need better information to guide where our priorities should be – sort of the “how am I doing?” approach - using the 2010 objectives, for example, get that out to researchers as to what the priorities are, including current information on progress, etc
 - o We do have to pay more attention to conveying our research priorities to outsiders – we have limited efforts to really think about what our priorities should be – we need to think more about this issue of priority setting
 - o Is there going to be a gatekeeper? Who decides which questions need to be answered, what data needs to be collected, and which can wait?
- Incentives and value of data:

- We need to better understand and perhaps more importantly to provide incentives to why we share data and how we share data – we can give structure to the problem
- Difficult to know who would benefit from your data other than the funder
- Incentives are critical – it's very difficult to get people or agencies or firms or anyone to give things away that have value to them
- If data hold value to people for publishing or for competitive edge or whatever, we can't ignore that, we need to find ways to offset it, to make sharing more valuable than not sharing
- More information on how foodborne illness varies by demographics
- We need to focus on global information: Much of our food not produced in the U.S, we need to know lots of information about rates of disease, etc, rate of human illnesses are, etc, in the areas in which food is produced
- Meta-analysis is a useful activity – taking stock of what's been done and what's been learned to refocus efforts on greatest needs
- We can improve or enhance existing websites: improvements or updates to FoodRisk.org but which was a bit closer to a news-site though not a real-time operation – something that could regularly keep an eye on what was going on – would need to be hosted at a university
- The role of technological change is pushing us into a new arena of data sharing issues and this presents both opportunities and obstacles - we can take advantage of new technologies
- If you're on a review panel, you can't share what you learned on the panel, but it may be useful in your own pursuit of research, so join a panel.
- Time is a major constraint for most people and a key reason why data aren't shared – it requires effort and there's very little payback to the individual for doing it.
- Keep the consumers involved – we are on the same side and can help each other – we are advocates for increased food safety funding
- We are swamped in information: growing and growing, and it's only going to get more overwhelming to sort through