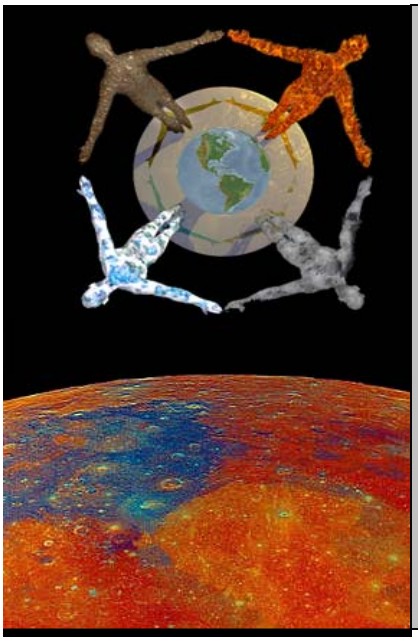

SCIENCE & TECHNOLOGY FORESIGHT

A Report from the Technology Foresight Directorate

Office of the National Science Advisor

Government of Canada

ANIMAL HEALTH FORESIGHT PROJECT: Minneapolis Scenarios Workshop Report

March 23 - 24, 2005
Minneapolis, Minnesota

This report has been prepared by:

Lynelle Spring
SpringWorks Consulting
54 Qualicum Street
Ottawa, Ontario, K2H 7H4

lynelle@springworks.ca

Foreword 2005

The Science and Technology Foresight Directorate (STFD) of the Office of the National Science Advisor (ONSA) produces documents and reports for the benefit of sponsors, participants and professionals interested in how emerging and prospective developments in global science and technology might impact our futures in Canada, North America and the world. This document was prepared as part of the **2005 Animal Health Foresight Project**, co-sponsored by the Canadian Food Inspection Agency and the United States Department of Agriculture.

The STFD operates as a collaboratively structured partnership activity within the Canadian Government. We undertake national and international projects with multiple partners and stakeholders from federal and provincial governments and agencies, universities and the private sector. Partnerships are developed around specific themes or projects. We use foresight tools and methodologies to stimulate longer-term thinking, develop horizontal linkages and build shared R&D awareness and capacity to better prepare Canadian and global S&T and policy communities for new challenges.

This research report is the property of those who participated in the processes described herein, and therefore reflects the combined views of the participants and the best wisdom and creative thinking stimulated by the foresight process.

This document does not represent an official view of any one organization who contributed to the research. Although this work is undertaken under the leadership of the Government of Canada and the United States, it does not signify endorsement by their Departments and Agencies unless so indicated.

It is useful to recall the definition of S&T Foresight that was used to define the scope and focus for this research:

> *S&T Foresight involves systematic attempts to look into the longer-term future of science and technology, and their potential impacts on society, with a view to identifying the emerging change factors, and the source areas of scientific research and technological development likely to influence change and yield the greatest economic, environmental and social benefits during the next 5 – 25 years*.

S&T Foresight is necessarily speculative, creative and analytical. It relies on both the interpretation of S&T change drivers and on how, if and when these drivers could become significant factors in emerging social, economic and political realities. Since these are highly uncertain, foresight is inherently about attempting to understand and reduce – or at least prepare for – significant risks.

Because of this context of inherent uncertainty, foresight participants and stakeholders should not regard this report as fact or prediction. It represents collaborative research that was conducted primarily for learning purposes, with the understanding that emerging consensus around some elements might warrant a further, more detailed examination. This is the nature of foresight – creating a range of plausible future scenarios that in their diversity should alert readers to the kinds of issues and perspectives that they may not have considered in initial research planning and contingency thinking.

In foresight, each player, sponsor or participant takes away some collaborative learning and experience that is tacit and more deeply resonant than the descriptive or analytical accounts contained in the reports. These indicate how various foresight approaches and tools can be applied to help readers become better prepared or at least more capable of contingent planning and action in these turbulent times.

Jack Smith
Director, Science and Technology Foresight
Office of the National Science Advisor, Privy Council Office, Government of Canada
jesmith@pco-bcp.gc.ca Tel: 613 957-5346 Fax: 613 948-6667

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1.0 BACKGROUND

In 2000 the Chief Veterinary Officers (CVOs) of Canada, the United States, Australia and New Zealand, decided to support a project designed to explore alternatives to large scale depopulation of domestic livestock as a mechanism for disease control. The first step was the **International Workshop on Animal Disposal Alternatives (IWADA)** held in Winnipeg, Manitoba in 2000.

IWADA continued to advance the agenda in a series of international meetings, and in 2004 agreement was reached for each member country to pursue one of four pathways forward:

1) vaccination and immune enhancement
2) alternative health strategies
3) communications, and
4) anticipation/prediction capabilities.

Canada assumed the lead role on the fourth component. **Dr. Norman Willis**[1] was engaged by Canada's Chief Veterinary Officer to develop a team and identify a process to formulate alternative options for effective disease control without mass animal depopulation. The objective was to explore potential strategies and options which could be provided as advice to the Chief Veterinary Officers of Australia, New Zealand, USA and Canada.

The **2005 IWADA Animal Health Foresight Project** (AHFP), co-sponsored by the Canadian Food Inspection Agency and the United States Department of Agriculture, was designed as a four part process:

1) January 31 – February 1, 2005 Lansing, Michigan – Scoping Workshop
2) February 21 – 22, 2005 Calgary, Alberta – Scenario Building
3) **March 23 – 24, 2005 Minneapolis, Minnesota – Scenario Building**
4) April 13 – 14, 2005 Ottawa, Ontario – Synthesis

This report documents the third meeting that took place in Minneapolis, Minnesota on March 23 and 24, 2005.

[1] Dr. Norman Willis, President of the Norm Willis Group, Inc. of Ottawa, Canada

Wednesday, March 23, 2005

2.0 PROJECT OVERVIEW & MEETING OBJECTIVES

Facilitator **Ken Andrews**[2] offered a welcome and initiated a round table of introductions.

United States Sponsor Representative, **Carol Tuszynski**[3]**,** extended thanks to all attendees, and noted that the level of interest in the project was very high, with a significant number of invitees expressing regret that they were unable to participate.

She invited participants to make the imaginative leap to the year 2020, and noting that:
- working in the future is "turf-free"
- the year 2020 belongs to all
- a futures-oriented process frees participants to think about issues in a broader sense.

She noted that the project team had, out of necessity, prepared the groundwork for the process and sketched out a scenario schematic as a baseline for the workshop. Participants were, however, encouraged to comment, question or identify gaps in the process.

Canadian Sponsor Representative, **Norm Willis,** provided an overview of the IWADA Animal Health Foresight Project (AHFP), as summarized below. (Please refer to Appendix D for the complete presentation.)

- The IWADA concept has been evolving over five years, looking for alternatives to the current approach of mass stamping out of animals. This meeting is one of a series, co-sponsored by Dr. Brian Evans, of the Canadian Food Inspection Agency and Dr. John Clifford, of Veterinary Services, United States Department of Agriculture.

- Around the world, people agree that this is important and needs to be done…but no one has yet proposed a solution.

- IWADA is not traditional emergency-preparedness or response. It is future oriented…looking for opportunities, understandings, tools, and a range of options not currently available. The goal is to create more choices for Chief Veterinary Officers facing a disease outbreak.

- There have been three international workshops to date.

- The first, in Winnipeg in 2000, looked at factors driving change, why we should care, what was putting pressure on a search for a change in perspective.

- The second, held in Ottawa in 2002, focused on two things: What tools are currently available? and secondly, What can we look for that we need? This led to a Pathways Forward document – eight critical pathways. It also provided a hierarchy of values – a

[2] Dr. Ken Andrews, President of High Impact Facilitation, Ottawa
[3] Ms. Tuszynski is the Leader, Center for Emerging Issues, Veterinary Services, USDA.

conceptual approach to decision-making – from prediction/interception to prevention, followed by containment, and disposal. A hierarchy of disposal options was also developed for the OIE.

- A third workshop was held in April 2004. Four of these eight critical pathways were examined… each of the four countries took one and prepared a report. Fifteen recommendations resulted from this IWADA workshop – this Animal Health Foresight project represents one of the recommendations.

- This project differs in its approach from those taken in the past. The Principles of the project are:
    - Disease control must always be considered first
    - Allow animals to reach the original purpose for which they were bred
    - Humanely achieve the highest possible value from the animals if they must be slaughtered.

- To date, IWADA has made progress on the 15 recommendations:
    - An anticipation (prediction) group has been established under Dr. Fonda Munroe (Canada).
    - Leadership training modules have been established under Dr. Will Hueston (USA) – new ways of thinking, new paradigms for animal health.
    - A concept paper has been developed on vaccination by Dr. Rob Williams (Australia) – may be advanced to form OIE guidelines for other countries.

- Mission of this Meeting:
    - Develop plausible alternatives to the mass depopulation through "stamping out"
    - Provide CVOs with a greater number of options for decision-making.

- Challenge:
    - To think of an approach that has not been thought of before
    - To identify ideas or concepts that might have been missed in previous explorations.

- Approach:
    - To use Foresight tools and methods, led by Jack Smith and his Foresight Group from Canada's Office of the National Science Advisor.

- Process: the Animal Health Foresight Project has four steps:
    - An initial meeting in East Lansing, Michigan aimed to scope out the question.
    - A second meeting in Calgary, Alberta brought together a larger group with different backgrounds, aimed at gaining a Canadian perspective.
    - This third meeting in Minneapolis will focus on gaining an American perspective.
    - The fourth, and final meeting will be held in Ottawa in April to synthesize the data and distill the advice to the CVOs.

- All of this work will provide input for a larger exercise – with the intent of also involving Australia, and New Zealand. The hope is to gain a broader perspective leading to a paradigm shift and new perspectives, and to carry this forward as advice to the OIE with the intention of contributing to international standards for all countries to use as a guideline.

3.0 FORESIGHT INTRODUCTION & PROCESS

Jack Smith [4] provided a briefing on the use of Foresight as an anticipatory tool in science policy development, noting that it is increasingly employed by organizations and industries as diverse as the European Community, Rand Corporation, Global Dutch Shell, and the Global Business Network. Canadian-led applications have included discussions on climate change, future fuel developments and science and technology for developing countries. Some key points in the presentation are summarized below:

- The future is unpredictable; Foresight allows us to explore many prospective futures and be better prepared for a range of plausible possibilities.
- The key question is not whether something is going to happen, but what actions we would take if it did.
- Foresight creates an "outside in" perspective.
- The development of new networks – comprised of decision-makers, scientists, academics and practitioners – is an important outcome of Foresight work – allowing us to expand our perceptions and develop new ways of viewing a challenge.

A ten-step outline of the general Foresight process was provided:

1. Define Project Topic
2. Review Current Situation
3. Identify Key Lenses
4. Answer Challenge Questions
5. Identify Change Drivers
6. Select Critical Drivers
7. Identify Scenarios
8. Populate Each Scenario
9. 'Backcast' from Future to Present
10. Synthesis & Recommendations

(Please refer to Appendix D for the full presentation.)

[4] Jack Smith is Director of Science & Technology Foresight, Office of the National Science Advisor, Privy Council Office, Canada

4.0 MEETING ASSUMPTIONS & OBJECTIVES

Ken Andrews walked participants through the steps taken to integrate Foresight techniques with the substantive requirements of the Animal Health Foresight Project.

He summarized the organizing team's **Key Assumptions** going in to the process:

1) Increasing societal concern in many countries about the continuing viability of broad depopulation as the preferred method of dealing with critical situations involving animal diseases. It is now important that leading animal asset management nations anticipate various future contingencies with alternative strategies for disease management.

2) The increasing potential for major disease events demands the availability of a range of response strategies, in the absence of which, mass destruction will continue and predominate.

3) The OIE has been successful in developing international standards for trade based on the latest scientific information. Any new approaches for animal disease control will seek to have the OIE incorporate them into international standards.

4) The primary objective of any alternative strategy must always address disease containment first.

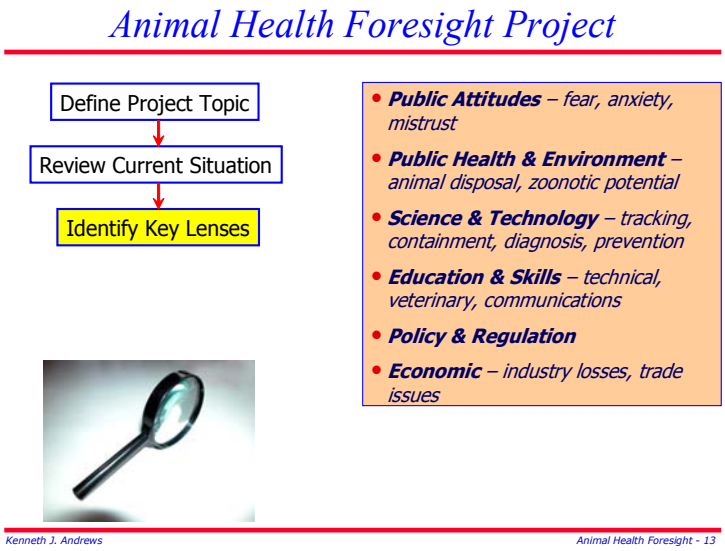
The **Workshop Objective** was re-confirmed:

> **The formulation of alternative options for effective disease control without mass depopulation, which could be provided as advice to the Chief Veterinary Officers of Australia, New Zealand, USA, Canada.**

5.0 CHALLENGE QUESTIONS

In introducing the Challenge Question exercise, **Ken Andrews** reminded the group that from this point forward all focus should be on the world of 2020. The purpose of Challenge Questions in the Foresight process is to build on the group's current expert understandings and knowledge – while expanding and sharpening their vision of what new ideas, technologies, social or cultural changes might be possible by 2020.

Participants reviewed the **Key Lenses** – or critical perspectives designed to stimulate a broader view of the problem – previously identified in the initial East Lansing Scoping Workshop.



Out of these Key Lenses, the organizers previously developed a set of **Challenge Questions** – mechanisms to encourage exploration of the issues – in four domains:

DOMAIN	CHALLENGE QUESTIONS
Information Management & Skills	1. In 2020, knowledge-sharing and emergency response to animal disease crises are both highly effective on a global scale. Describe how this is so, from the perspective of all stakeholders (industry, researchers, government), in terms of technology and people skills. 2. What new skills and training priorities for personnel have made the greatest impact over the past 15 years (i.e. since 2005) in the creation and implementation of innovative alternatives to MAD (Mass Animal Destruction)? 3. Today (2020) every animal in the food supply is individually tracked. What are the most important attributes of this tracking system, and why has it proved to be so beneficial?

Trade & Economics	1. How have changes in global livestock production increased/decreased economic incentives for mass destruction as a disease control strategy? 2. What changes in international trade agreements/standards have enabled countries to respond to foreign animal disease outbreaks without using mass animal destruction? 3. Today (2020), under what conditions do we let nature run its course during a foreign animal disease outbreak?
Policy & Regulation	1. What changes in the roles and responsibilities of industry, government, consumers, and politicians have been necessary to achieve a cooperative, science-based, effective and fully understood process to establish policy for the management of animal disease? 2. What policy changes have been necessary to create a paradigm of animal health optimization? 3. What changes have been necessary to allow a wide menu of choices for responding to animal diseases while maximizing the benefits for the global public and economic viability of industry?
Advances in Science & Communications	1. What advances set the stage for effective animal disease risk management without mass animal destruction (MAD)? 2. How have advances in communications tools and strategies reduced public anxiety over animal disease risk management? 3. How have influential leaders from various sectors been engaged around critical issues regarding animal and human health?

The group explored the *Information Management & Skills* questions in plenary, followed by three breakout sessions for the remaining question sets. A summary of those exercises follows.

5.1 Information Management & Skills (plenary)

Q. Knowledge sharing & emergency response to animal disease crises are now both highly effective on a global scale. How?

- High speed communications – to everybody
  - Through global co-ordinated agencies
  - Best practices based on science, etc.

- Harmonized disease response policies
  - all producer/consumer countries
  - collaboration between industry and government

- Intelligent internet – automated/protected
- Secure transmission, not subject to Freedom of Information
- Initiated, driven & paid for by First World (G8)
  - needs to be built as a sub-unit of a human disease reporting system, linked to research, diagnostics, surveillance, response, recovery systems
  - alternative viewpoint – high speed communications is problematic for industry – they may not share early disease information with government, public
  - Its possible government will be left out of early communication/notification – protectionist industry action
- There are strong incentives/requirements for all countries to participate, e.g. funding tied to compliance or emergency support
- It is also in the interest of the multi-nationals to participate
- Driven by multi-national commercial ventures
- Industry has larger role in decision-making processes – and they must participate to survive
- Mobile infrastructure for diagnostics, information and response management
  - E.g. Move labs to outbreak site, airplanes loaded with mobile labs, experts
  - SWAT team
- Improved animal/public health infrastructure
  - Better training for local producers
  - Local awareness, training & systems in place
- Mobile labs are empowered to enter any country
- Technology to support – local hand-held devices for every veterinary officer in the world to link into central systems – "diagnostic tricorder"
- Advanced farming communities will have bio-sensors:
  - animals tagged with individual smart-tags
  - early detection of disease
  - automatic link to central intelligence or to local veterinary officer
  - tiered response – hierarchy of information transmission
- Agricultural world is divided into two sectors:
  - animal agriculture which cannot pass certain borders (not linked to system)
  - animal agriculture with ability to move – this one will be linked to the system.
- The monitor and response depend on local consumption – could be problematic because it creates reservoirs.
- Greater recognition that it's all about public health – its in the best interest of all the world to monitor of emerging diseases
- New mechanisms for immuno-protection – faster than current vaccine development and dissemination

  - Vaccines in hours or days (to protect non-infected animals) manage viral mutations during the pandemic rather than trying to predict and produce in advance
  - Implanted/plant-based/aerosol – no need for refrigeration
  - Vaccines in real time
- Climate change – has concentrated food production – focuses where/how this technology is implemented – makes infrastructure more economic
- Improved mobile processing capacity:
  - Ability to move the slaughter, packaging and food irradiation technology to outbreak sites – allowing for greater utilization of the protein – on-site "slaughter house in a bus" … move the action to the farm gate
  - Improved risk communication and public education gains acceptance of the product for human consumption
- Highly effective and believable risk communications to the public.
- Traceability system linked to global communication/identification system – every animal (and animal product) in the food chain is traceable – beyond DNA – nano-bio-sensors, bio or nano-tags sprayed on each product
- Disposal/utilization – industry decides to re-organize to allow early processing on-site – can avoid need for mobile processing requirements
- Decentalizing all processing, vertical integration with producers
- Insurance industry more deeply involved in the process
- By 2020 73% of global population will be dying from chronic diseases – leading to far greater concern with quality of food – carcenogenics, genetic mutations, etc… things that lead to illness
- Certain countries are quarantined – because of local environment
- Disincentives for producers to report disease have been replaced by incentives:
  - mandatory insurance
  - financial rewards/compensation for reporting?
- Global value of animal protein has increased as a commodity – generating an incentive to invest in protection systems
- Population growth and improved Third World economies leads to capacity/desire for more animal protein
- Many/all of the political barriers to global reporting/response have been removed
  - International body has been created to advance animal disease protection – it has a mandate to override jurisdictional red tape
  - Triggered by multiple negative events – food shortage, etc.

Q. What new skills & training priorities have made the greatest contribution to innovative alternatives to MAD?

- Surge capacity of multi-lingual animal health specialists to be mobilized on demand
- Upgrading of veterinary infrastructure in the developing world:
  - driven by private-sector economics/multi-nationals who know that it is cheaper to produce in those countries, but that a global market requires better standards.
- Train veterinary experts to be better communicators
- Convince the media not to be 'nay-sayers'
- Improved decision-making capacity for global leaders:
  - decision support tools, automated systems, modeling, simulations
- Smaller, web-based training modules – "just in time" training
- Funding for these initiatives must move up the decision-chain… to federal/international level
- Improved training in disposal, euthanasia and decontamination skills

- Cross training of skills between veterinarian, economic, emergency management communities, threat communications – based on global, not domestic issues
- Emerging diseases are recognized as the norm, not the exception – we learn how to live with disease
- Don't forget wildlife – intersection with wildlife, domestic animals and humans is where disease meets
- Have to understand why some people do support MAD

5.2 Trade & Economics

Q. What was the vision for global livestock production in 2020?

- More specialized
- Mono-culture
- Specific niche markets – organic farming, commodity production
- New science resolves environmental issues, other constraints
- Questions as to the future of organic production

- Two possible models for livestock production:
    1. Production could be important in the developed world if there was recognition that providing food to the rest of the world was of value
    2. Livestock production could migrate to the developing world because that where the majority of consumers are and production costs are lower
- Traceability on a global scale
- Potential for use of disease-resistant species if public accepts the technology
- More production of ruminants – they can eat biomass that humans can t consume, or
- Smaller animals, such as poultry, with higher feed conversion ratios
- Meat production is for local use, rather than export
- Export production is concentrated, owned by multinationals who focus on poultry and swine – based on where grain is grown vs. where the consumers are located
- 'Power Centers' emerge and act as blocks – North & South America, Asia and Europe – with multi-nationals in each block competing
- Continents will start protecting borders like island nations do in 2005
- Animal welfare standards are implemented globally
- Climate/water stress – with wars over water
    - Production is forced to move to suitable climates – pushed by multi-nationals
    - e.g. Canada not able to produce grain, so moves to free range
- Protection of biodiversity – no resolution – could go up or down
- Prices of animal products rising world-wide due to
    - Increased production costs linked to water, grain or bio-food, animal welfare issues
    - Scarcity of the product – more consumers, more demand, more consumption

Implications of this vision with respect to the employment of MAD as a disease control strategy:

- Overall all those trends pointed to a reduction in MAD due to:
    - Improved technologies
    - Traceability – ability to direct animals to specialized markets, or to utilize within each block
    - Animal welfare concerns
    - Increased value of animal products
- However, multi-nationals around the globe might utilize MAD since an outbreak in one country is just a small part of the production chain.

Q. International trade agreements in 2020

- Allow countries to recognize other methods of containment – sealing trucks, irradiation, other alternatives
    - Regionalize at smaller levels
    - Stratification by production type for recognizing disease status – commercial vs. backyard
    - Zones of freedom
    - Concentrated production allows assurance of compliance …which we can't now document with such dispersed production
- Emphasis on removing the agent not the host
    - Vaccination
    - Consumption
    - Other means
- Zoonosis different from non-zoonosis – different standards
- Trade channels developed to move treated products to 'willing markets'
- Harmonization – either world-wide or by zone, i.e. 'Power Centers' – agreements could include bans on MAD
- Disease standards included in trade agreements between Power Center zones
- Private sector setting standards – e.g. McDonalds?
- Government standards minimal
- Companies will comply with what they need for their consumers – but it creates a price differential
- Certification and accreditation done by private sector – for a variety of purposes
- Influence on trade agreements - issues with respect to the some countries owning the animal production (and other types of production) of other countries

Q. When would you let disease run its course?

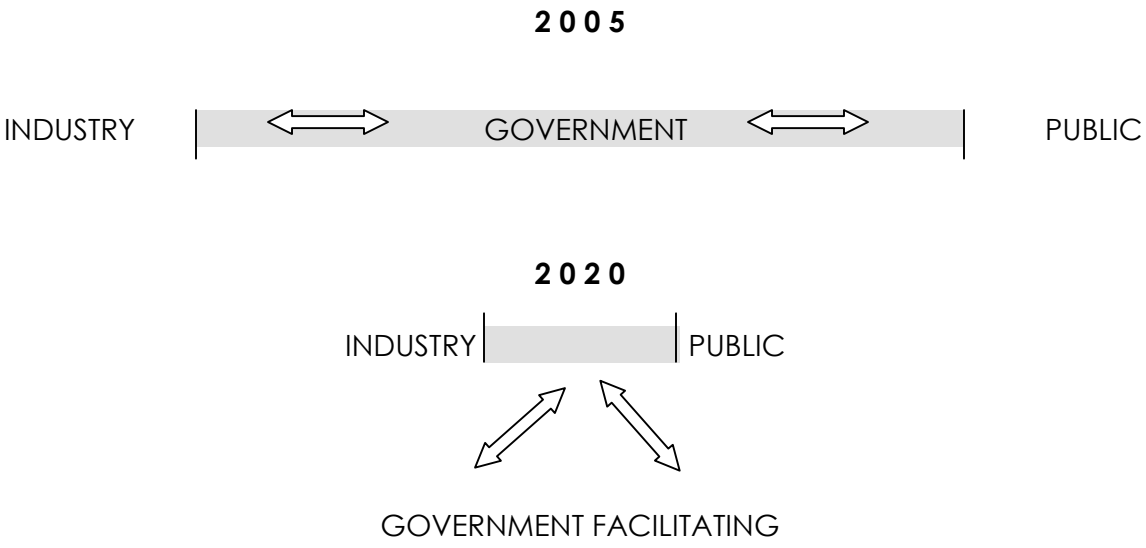
- If its in the wild
- If its in a closed/terminal production system
- When you can contain it
- When the animals (indigenous diseases) are likely to have continuing exposure to the diseases - Porcine Respiratory Reproductive Syndrome, Infectious Bovine Rhinotracheitius, etc.

5.3 Policy & Regulation

This group presented a North American model but suggested that it could be have international application.

Q. Changes in roles and responsibilities

- Public is better educated
  - more 'science literate' and therefore a more informed electorate
  - less fear-driven, better educated in science and values, etc.
- Industry continues to take on a more self-regulating role
- More proactive
- More aware of public opinion
- Responds voluntarily because it makes good economic sense
- Therefore less resistant to changes – so fewer regulations required for compliance
- Industry shapes policy in concert with public
- Industry is much more aware, in sync, responsive, actively considers public opinion… to its own economic advantage
- Industry has self-regulated to a very high standard – better economics, reduced litigation, more positive image.
- Government and industry work cooperatively to proactively shape public debates.



- Enhanced standards and labeling accepted by all in first world governments
  - exported to all – especially the G8
  - better communication with & education of the public helps them understand the value of the standards
  - as a result, the public believes in standards – they see them as both effective and true
- Industry is self regulating and must manage its own risks
  - Public has confidence that this is in their interest

  - Public trusts that the self-regulating industry is effectively managing animal disease
  - Process is transparent
  - Key to success and public trust is industry's proven track record in disease management

- Why would industry take on this extra responsibility?
  - Economics and public confidence
  - Ability to control its own destiny (remove political influence from the picture?)
  - How to handle the big global disasters? (Need government help?)
  - There may be a safety net… (e.g. insurance)

Noted:
- Unsure of political reactions to this vision – would governments recognize the need to help with global disasters?
- This vision demonstrates a shift in industry perspectives – it is significantly different from a regulatory model such as the EU model. This one is industry driven.
- A Canadian perspective – the Canadian industry is very fearful of regulation.

Q. Improved animal optimization – what policy changes drive it?

- Improved public funding for animal disease research – extra-murally – and conducted in both the private and public sectors
  - Noted that the funding levels will probably have to drop before they rise again, and that this is probably driven by crises – one or more 'trigger events' tied to zoonotic and/or food safety issues
  - The triggers result in a change in viewpoint – development of a broader view to prevent the next problem
  - Actions are tied to a zoonotic or food safety issue

- MAD is banned because:
  - animal rights, animal welfare, environmental lobbies
  - but this is contingent on the fact that alternatives and containment strategies are now proven to be safe

- Diseased animals are now accepted as food because there are proven methods of guaranteeing public safety

- Media – those policy changes need to engage and involve media… they perceive themselves as public watchdogs.

5.4 Advances in Science & Communications

Q. Advances in animal disease risk management?

- Best practices widely accepted
    - Multiple available options based on science
    - Defined contingencies
- Options available
- Diagnostic tools that support real time surveillance and anticipation of disease
- Harness communications to support disease diagnostics and surveillance without misinformation
- Parallel secure communications channel to share data of proprietary nature
- Technology available to characterize risk in exposed animals – if animal is positive on diagnostic test not necessarily a risk – not only evaluating exposure but risk levels
- Technology adapted to both intensive and extensive agriculture; both small and large industries

Q. How leadership engaged?

- Enlighted leadership – steps up to develop best practices and drive risk communication
- Broad leadership from medical community, consumer groups & politicians as well as animal protein industry and regulators
    - Special interest groups, NGOs etc, also included
- International coalition of standards agencies supporting best practices
- Active global leadership pushing acceptance & implementation of best practices (harmonization and equivalency) in countries around the world
- Action plan to respond to disharmony by assessing latest science and revising best practices and/or push for harmonization
- Accountability and consequences

Q. Advances in Communication

- Talk about futures before they happen! No surprises, we have mapped contingencies
- Best practices for risk management have been effectively communicated to all audience
- Active engagement in discussion options, science and best practices
- Shared interest in animal and public health underlies broad cooperation between agriculture, industry and consumer groups, etc
- All involved in thinking through alternative futures
- Active discussion of societal concerns and production agriculture
- Publics are able to interpret breaking news in perspective of risk management for animal and public health
- Publics focus on risk rather than disease status, recognizing that diseases happen and that disease does not equal risk
- Widespread recognition that life involves risks … and active support for risk management and communication
- Animal health and public health professionals adopt risk management paradigm
- Term “stamping out” becomes arcane
    - …make “public health" an interesting subject for veterinary students

- Shared leadership of both small and large producers/processors/distributors, etc.
- Shared leadership in developed and developing world

- "*Healthy animals/healthy people 2020*" a roadmap of shared goals prepared by a coalition of the World Health, Animal and Food organizations in 2005

    - Animals seen as part of healthy people in terms of nutrition as well as infectious disease
    - Goals set for:
        - Adoption of best practices
        - % drop in human disease related to animals/animal products
        - Improved public health education
        - Decrease in protein-deficient malnutrition globally
        - Reduce starvation globally through animal production, distribution, genetics and enhanced foods

6.0 BEST PRACTICES IN RISK COMMUNICATIONS

Will Hueston introduced **Dr. Tim Selnow**, Professor of Communication at North Dakota State University, and an associate with the National Center for Food Protection and Defense. The National Center for Food Protection and Defense works with a coalition of ten universities, bringing together experts and practitioners in risk communication, journalism and psychology, since no single university in North America has a critical mass of expertise in risk communication.

Dr. Selnow offered an overview of this group's work in identifying best practices in risk communication. Nine key concepts were presented for effective risk communication strategies:

Take stock. Where are we now?

1. Pre-event planning & logistics
2. Collaborate & coordinate with credible sources (networks and partnerships)
3. Accept uncertainty and ambiguity (do not over-reassure ourselves of the public)

Determine goals. Toward what are we working?

1. Forming partnerships with the public (stakeholders)
2. Listen to the public's concerns (perception is reality)
3. Be honest, frank and open (virtue)

What must we be prepared to do?

1. Meet the needs of the media and remain accessible (view the media as a resource, not a nuisance, see the media as a service to the public)
2. Communicate with compassion, concern and empathy (this builds trust – lower public trust increases the risk levels)
3. Provide self-efficacy (what can *I* do? Give people options to improve their situation)

(Please refer to Appendix D for the full presentation.)

Discussion

Q. How do you deal with demand for zero risk? "Tell me it's safe."

R. If we say, "We can never get to zero risk but the risk of you being infected is the same as being hit by lightning"… It doesn't work! Because people also believe they can win the lottery, and they know someone who has been hit by lightning. What research has shown does work is self-efficacy… give someone something to put them at lesser risk.
The principle of "choice"… you have the option to lessen your risk

Q. Do you say "There isn't a zero risk option" ?

R. Yes! Because it's true – open and honest.

Q. However, the public doesn't really know what the real risk level is – animals in the food chain customarily may have lots of vaccinations, or some level of disease.

R. If you have the communications started you can build on it, but there's also an understanding that the rate of information delivered is important – too fast and the public will tune out; they will fixate on something less important, not on the key issues. For example, when people are worried about beef being inoculated…they may choose to eat non–inoculated beef, and therefore their risks increase. Need to understand that we do this routinely… and then there is a chance they'll accept it.

Q. What do we do about the proliferation of misinformation?

R. This is a key problem – need to establish reasonable sources for the media… like the new National Centre for Food Protection and Defense – so media has someone accessible and credible to go to. Takes time, consistency, proof…. Irresponsible journalism sells.

Q. Isn't the act of undertaking a foresight exercise is a plus for an organization… it becomes a credible story… reinforcing the sense of readiness and trust – pathways to the future they want?

R. Yes. The fact that these agencies exist is a sign to the public that the government cares.

Q. When you have such a short sound bite – how do you approach the problems?

R. 1) Identify your spokespeople in advance and train them 2) develop 'B roll' film sources and make it available – give the media improved visual elements that they can cheaply incorporate into their storylines

Q. Credible spokespersons need to be believable… but mostly they are in a highly defensible mode. How do you counteract that?

R. We need to work on this. EG.. when anthrax letters were distributed recently, the media wanted to speak to CDC – but CDC wasn't used to live communications, just issued news releases. Another situation resulted in a whole flock of spokespersons being sent out… not good for message or for messenger. Also, when media doesn't get access to credible spokespeople…they'll take anyone…and then you have no control over the message.

Thursday, March 24, 2005

7.0 OVERNIGHT REFLECTIONS

- Participant noted that his students have articulated a fear of the future. This project may dispel some of the fear – which may, in turn, dispel some of the barriers we may encounter.

- Yesterday talked about harmonization – would that discussion help government make better decisions?

- Need to define standards for mass casualty that consider both the animals and food or bio issues. Also, need to both do a good job of MAD and also to do less MAD. Need to do it very quickly – if we can respond within 24 hours, it takes 180 days to remove the disease, but if it takes us 3 days to respond it will take 312 days to get rid of the disease.

- Best practices & incentives – utilize them in:
    - insurance policies
    - contracts – between multinationals and producers
    - land use – farmers have to have land use documents – could incorporate how they dispose of animals

- Epidemiological models suggest that most important element in limiting the size of the problem is early detection. Quick detection and intervention is best. The question is how can you align the economics to the science?

- Surprising how much consensus in the breakout groups – issue of public health, multinationals as drivers, etc.

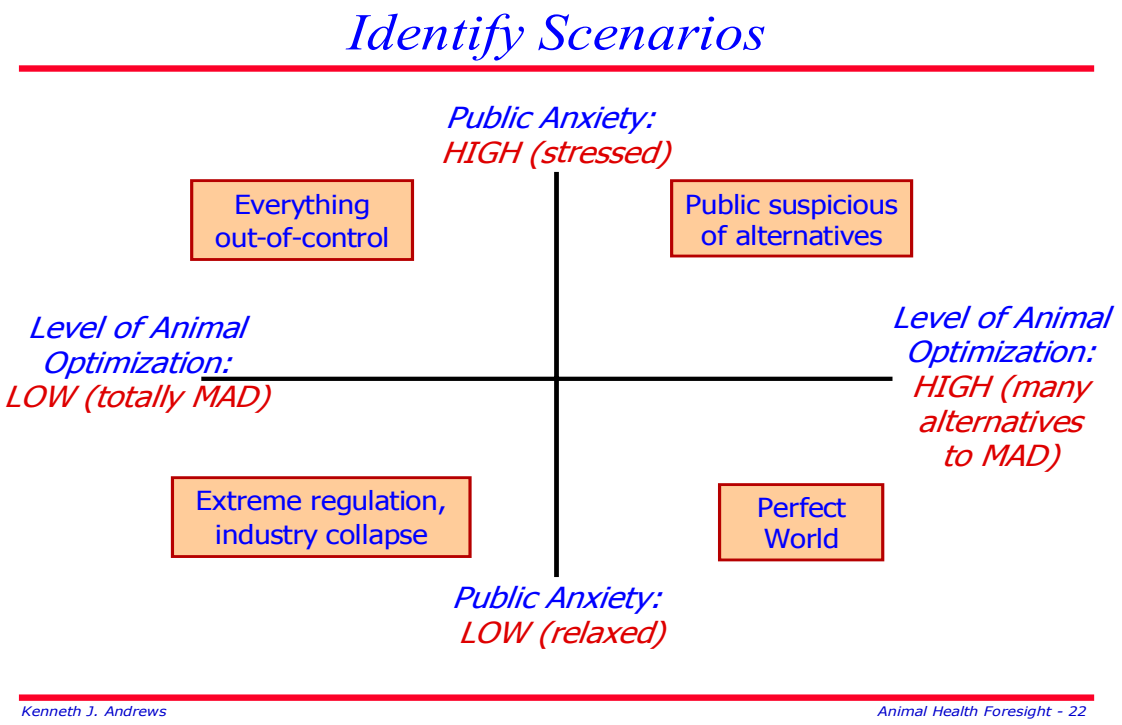
- Question re the insurance issue… suggesting that government not provide indemnity… it's an industry issue?

- UK lesson learned – that industry bears greater percentage of the cost. Refining a levy system – e.g. The Australian example. Other examples: flood insurance, house insurance, etc. Risk tables as they associate with animal destruction will become part of how we do business.

- This provides a good incentive for good bio-security practices – lower premiums.

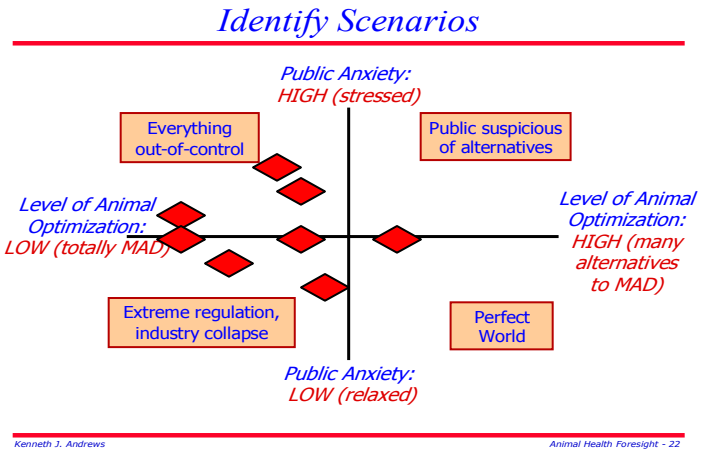
8.0 SCENARIO DEVELOPMENT

Ken Andrews reviewed the East Lansing Scoping Team's work in identifying **Critical Change Drivers**, and the development of the schema for scenario development deployed both at Calgary and the current meeting. (Please refer to Appendix D for full presentation.)



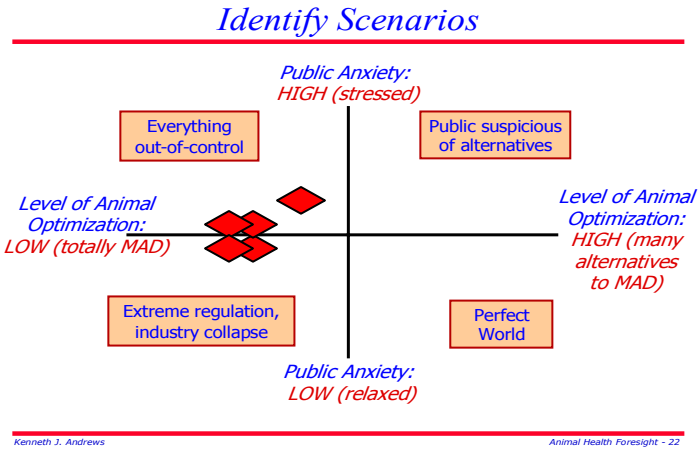
8.1 Current Situation – Composite View

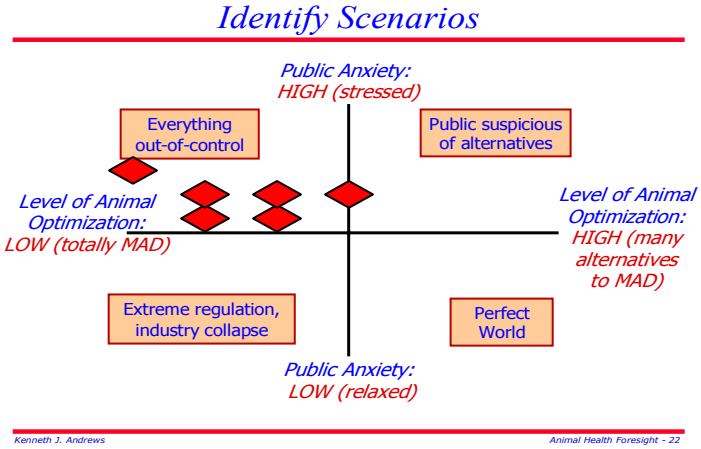
Each of the teams also recorded their impressions of the current state of events, as depicted on the charts below:



Perfect World

Over Regulation

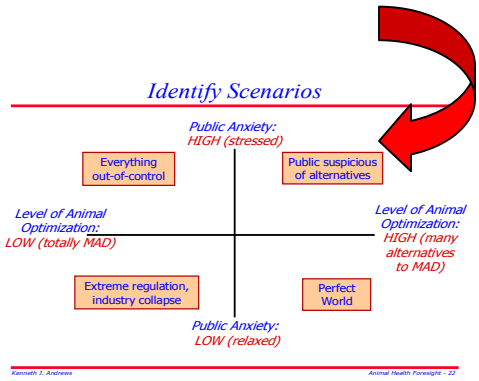




Out of Control

The group then used a set of scenario population questions to develop the "Public Suspicious of Alternatives" scenario in plenary, as follows:

8.2 'Public Suspicious of Alternatives' (plenary)



Q What are the reasons for the public's high anxiety level?

- Public still concerned about disease
- Public trust not developed at same rate as alternatives to MAD
    - Poor communications
- Natural state of mind that public is suspicious of science
- Public doesn't know if food is coming from a diseased animal
- Public distrusts the motive of industry – alternatives are driven by economics rather than public interest
- Level of anxiety linked to level of affluence – maybe the scenario only applies to most affluent countries
- Public sees alternatives as government slacking in its regulatory responsibilities
- One "safe" alternative turned out to be unsafe
- Public growing concerned about the new technologies associated with the alternatives, e.g. nano-tags for food traceability
- Accepting new risks that the public have no control over
- Public food choices have shifted
- Public is not involved, engaged in the decisions about alternatives – scientific steering groups in charge – not listening to the public
- Public concerns not heard in a respectful environment
- The language/technique of risk analysis has not been used and concept of not 100% safee is difficult to communicate and receive

Q What technologies support or drive this scenario?

- Remote bio-sensors – early detection
- Shift from "disease freedom/safety" to "risk management" paradigms
- Rapid deployment of disease treatment facilities

- The developed world has excellent information-management processes for coordinating responses
    - Managing information
    - System is more intelligent/filters to a human
    - Better decision-support systems, e.g. Use of GIS systems to reduce infectivity, incorporating data layers reporting hydrology data, road systems, etc. re-route animals, grain, etc.
    - Decisions transmitted more quickly to field (at least to the G20)
- Advanced bio-containment – increases the number of alternatives, but secrecy leads to public anxiety
- Technology of real-time mass information
- Video/digital/micro technologies reveal some "bad" situations on farms
- Cheap and effective anti-virals
- Ability to render the infectious agent harmless, e.g. irradiation, cooking techniques
- Certified, decentralized micro-processing processes
- Dedicated regional slaughter-houses to harvest the diseased animals
- Improved animal traceability systems are the backbone for all responses
    - Fully integrated across industries, in G8
    - Every animal/all premises in the food chain
    - Linked to other analytic systems – GIS, etc.
    - Cooperative administration/**strategic international alignment:** financed by industry; with some international oversight, standards; government taking audit, validation role

    However:
    - Strategic international alignment is mandated, however, it is not transparent and not 100 percent effective
    - Some producers are suspicious – not supportive for fear of costs, lack of trust in government, systems
    - Technologies may be developed for specific sectors
    - Not shared among all sectors or sub-sectors
    - Disconnect - public still fearful about negative impact on public health – operating independently of agriculture sector, funded separately

PROCESS NOTE:

Participants were provided with the following **Scenario Population Questions**. These questions, linked to the earlier **Key Lenses** identified in the scoping process, were offered as tools to guide the discussion and encourage a full exploration of key issues and variables. Only the first three questions were employed in the plenary exercise above. The full set of questions was made available to the three breakout groups that followed. Groups were invited to choose some or all of the Scenario Population Questions as needed in the development of their scenario.

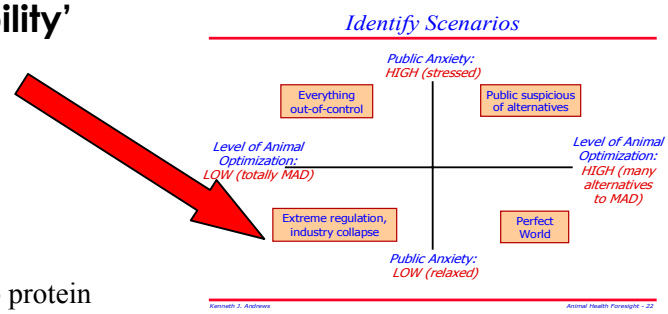
SCENARIO POPULATION QUESTIONS

1. Discuss reasons for the public's anxiety level.
2. How are economic choices made in this scenario?
3. What technologies support or impact this scenario?
4. What kinds of policies dominate this scenario?
5. What style & sources of leadership are required or support this scenario?
6. How do the public and media respond when a crisis occurs?
7. What are the roles for government, industry and other stakeholders?
8. How would a 'wildcard' event affect this scenario?

Upon completion of the team reports from the scenario population exercise, the decision was taken to eliminate the plenary 'practice' backcasting exercise and move the teams directly into the backcasting exercise.

SCENARIO REPORTS

8.3 'Plausible Destructibility'



Public Anxiety

- More severe problems for public – terrorism & economic collapse
- Shift away from animal protein to protein substitutes, highly processed products (no fresh product)
    - Intended to increase food safety
    - Leads to more convenience food
- Public demand for zero risk has led to destruction/disposal of animals/animal product – it is all highly regulated
- Public has confidence in government controls
- Well-developed system of regulations in place
- Advances in public health and trade requirements/responses has led to fewer negative events
- Low incidence, low visibility
- Confidence in producers
    - Organic farming explodes
    - Low-intensity agriculture
- Media loses interest in animal health events

Technology

- Technology is developing slowly. New choices haven't come about – no new vaccines, antivirals
  Or
- New technologies (vaccines, antivirals) are not effective…pathogens adapt
- Investment in animal health technologies decreases because:
    - Government shifts money to other priorities
    - Commodity nature/economics of the industry prevents investment and adoption
- Detection technologies well developed, resulting in rapid response capacity
    - In turn, this reduces the need for MAD alternatives
- Regulation and restrictions of products permitted in the market are made easier by technology
    - Data about problems and premises
    - Technology equipped government/industry
    - Risk assessment and modeling
- Mobile response/rapid diagnostic technologies not deployable outside the G8
    - Southeast Asia experiences a demand for stamping out

Economics

- Cost of response/stamping out borne by the industry – industry somewhat supportive of MAD because it is quick and cheaper…it's the industry preferred method

  - Animal production shifted out of North America
  - Environmental issues, e.g. methane
  - Competition for land, water, labour
  - Consumers are outside of North America

- High standards for imports (like Japan in 2000) and a high percentage of protein is imported
- High cost and high value-added production remains viable in North America
- More differentiation/range in animal product pricing
- Trade protectionism needed for G8 competitors
  - Standards based on values such as animal welfare and environmental protection

Leadership

- Industry leadership unable to resist strong government intervention driven by public anxiety
- Industry unwilling to tolerate disease in the global system
- Disincentive for optimization
  - Higher compensation for early response/reporting
  - Takes too long for alternatives or too expensive
- Industry transcends national boundaries
- Industry/government communication good
- Government accepts and supports MAD
- 'Flame-thrower … checkbook … zero risk'

Media

- Media becomes a non-player – this is a low interest story
- Doesn't generate the news
- Outbreaks will be taken care of quickly
- 'the machine is rolling'

Wildcards

- Emerging disease for which there are no diagnostics
  - Stamping out make it worse
  - Can't keep up with rate of transmission

- Bioengineered terrorism event
  - Akin to 9-11 issues… destabilizing

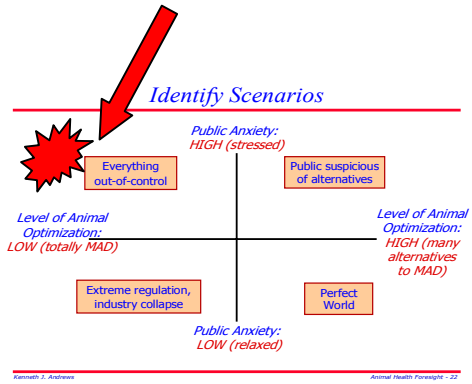
BACKCASTING – 'Plausible Destructibility'

	Science & Technology	Policy & Regulations
2010 - 2020	▪ Detection technology paramount – biosensors, pen-side testing ▪ Smart networks to handle the data, intelligence ▪ Acceleration in sophistication of traceability technologies like nano-tags	▪ Insurance schemes developed for animal production and enacted ▪ These are driven by regular interruptions in trade ▪ And initiated by industry ▪ New import requirements put in place in North America for animal welfare, etc. ▪ FAO becomes a stronger response organization
2005 - 2010	▪ Preparatory investment in rapid diagnostics – DHS ▪ DNA/genomics work accelerates ▪ Traceability protocols put in place widely	▪ Industry-government cooperation on disease program to prevent major event - LPAI program. BSE ▪ Stovepipe response ▪ Successful management of disease events reduces public anxiety

	Public Attitudes	Public Health & Environment
2010 - 2020	▪ Public confidence in food supply is achieved (MAD is acceptable) ▪ 'Mini-MAD' seems reasonable to all	▪ Major public health /animal health pandemics are thwarted by readiness
2005 - 2010	▪ Demand for organic production increases exponentially ▪ Public demand for zero risk accelerates ▪ Media does stories on increased readiness, response capacity, etc.	▪ Environmental requirements force MAD to be strategically managed and applied ▪ Environmental contamination events

	Economic Impact	Education & Skills
2010 - 2020	▪ Cost of North American production increases due to environmental rules, animal welfare ▪ Animal production in North America is reduced, switches to niche production	▪ Industry and government are able to apply new diagnostics/detection techniques ▪ Aggressive implementation of techniques like GIS, etc. to get to Mini-MAD and encourage early detection
2005 - 2010	▪ Animal production continues to expand at an accelerated rate in the developing world ▪ Acceleration of SPS based on trade restrictions ▪ Industry becomes very proactive to forestall government over-regulation and re-engage markets after BSE, AI	▪ Public understanding of risk assessment remains poor ▪ Veterinary school curriculums don't include risk analysis ▪ Policy makers not skilled in risk assessment

8.4 'The Perfect Storm'



Vision for this Scenario

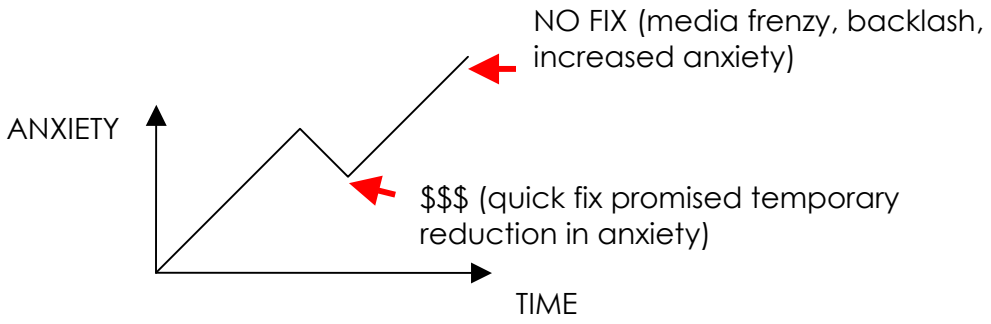
- Participants decided that the scenario was moved farther up and left on the axes…indicating a more severe situation.

Why is public anxiety high?

- A series of animal health events handled badly – probably in North America or the G8
- These events were handled badly over time, with the result that public trust was eroded.
- Animal health issues – linked to major human health issues
- These unexpected events introduced 'new agents' – the public had little confidence in science community capacity to respond to it
- Responses were unsatisfactory
- Low level of trust – whole infrastructure – scientists, officials, government finger-pointing, making excuses …led to heightened public anxiety.
- Inconsistent communication – poor risk communication and over re-assurance
- Anxiety fuelled by opportunists seeking to get money or to advance their causes
- Media reinforced the negatives
- Politicians had a compelling desire to act… then flip-flopped

How are economic choices/decision made?

- Decisions are poorly made, with little or wrong information, acting too quickly
- The public is demanding action, ignoring science
- Money is thrown at the problem
- May temporarily reduce anxiety but won't fix it (see graph)



- Government provides bail-out money to troubled industry (short term) instead of investing in better resolution of problems – it's a short term fix.

- Non-affected states/countries are protectionist out of fear – become opportunists, politicians must be seen to do something
- Local quarantine escalates local anxiety … raises questions as to why other countries are better protected
- Multi-nationals move offshore – distance themselves from the problem
- Move to a non-MAD country
- Result is that they don't invest in solutions
- More imports… food is more expensive
- Lack of local quality control
- Greater public anxiety

Science & Technology

- Science is not proven to be effective in solving this problem
    - Do we understand it?
    - Is the solution taking too long to find?
    - Are the solutions safe?
    - Response not focused
- No live animal early-warning system
- Science resources not available because infrastructure is not directed to this animal health issue
- Basic underlying science has not been done in this scenario
- Government/industry historically have not invested in resources and solutions/prevention
- Focus on other priorities like security, short-term issues
- ROI on prevention is perceived to be poor
- Science for alternatives to MAD is available, but not implemented… too expensive? Who approves it? Who funds it? Why do it?
- Still lots of 'turf' issues and barriers…bureaucracy, money
- Science is not coordinated or integrated, lacks goals, milestones
- Science contradicts itself with competing science teams and pharmaceuticals… as a result… it becomes less believable

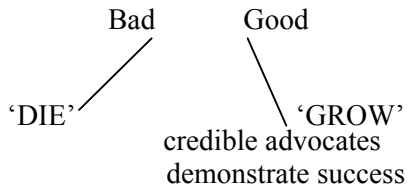
Leadership

- Public is not getting good information about what it can do
- No consistent message
- Conflicting leadership from different sources
- Lack of transparency and over-reassurance
- Avoidance of leadership/ownership – finger-pointing, "someone else's fault/problem"
- Poor decision-making, too narrow, go with the polls
- Try to pacify the public… but it's not effective in 2020

- Public is not getting good information about what it can do
- No consistent message
- Conflicting leadership from different sources e.g. government, industry, etc. – all over the map
- Lack of transparency and over re-assurance
- Avoidance of leadership/ownership – someone else's fault and problem

Wildcards

The team chose to look at both a positive and a negative wildcard.

Negative - Earthquake	Positive – Live Animal Test
▪ Could make the situation worse, e.g. by disrupting the food supply ▪ Or ▪ Could take the issues management problem off the front page, offering temporary respite, and providing science with time – 'breathing room' – to develop new options ▪ Or ▪ Act as a 'wake-up call', e.g. 9/11	▪ This new live animal test was early, and reliable ▪ However, the response is contradictory ▪ Public is still suspicious – 'here we go again' ▪ Leadership (all types) 

BACKCASTING – 'The Perfect Storm' Scenario

This team chose to place all actions with in a single time reference of 2005 – 2020.

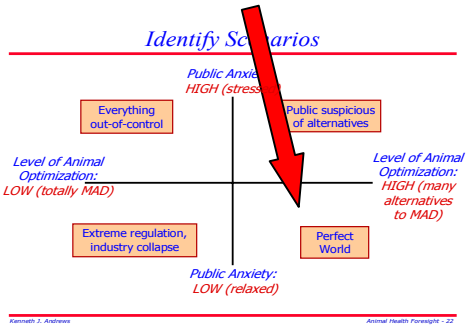
	Science & Technology	Policy & Regulations
2005 - 2020	▪ NIH scientists lose independence and credibility… ▪ Linked to a science disaster – like thalidomide – a bad vaccine, or bad advice ▪ No funding for basic research – or infrastructure ▪ No apparent immediate ROI in the near term ▪ "squeaky wheel" ▪ Iraq2 = energy crisis, which in turn diverts science funding ▪ China – rapid population growth is a strain on the food supply ▪ Emphasis is on satisfying the Chinese market demand, rather than on fixing the problem…although this could drive alternatives – need to use MAD meat more effectively	▪ Science funding not keeping pace with needs ▪ Rift between public and animal health is a chasm – driven by human disease outbreak ▪ Lack of strategic thinking among all stakeholders ▪ Multinational food companies leave the US for Australia because science and politics are wrong and the public favours imports ▪ Big fast food chains use only imported beef ▪ Significant leak of private information or secret study dealing with projected deaths ▪ A newly elected government imposes MAD on all animals older than 30 months…things are out of control… the US President is a vegetarian

	▪ Rift between government and industry regarding regulations ▪ Multiple animal disease problems poorly handled – establishes a pattern of mis-management and tips public confidence over the edge ▪ "distasteful" to invest in solutions … leading to greater risk to public health	

	Public Attitudes	**Public Health & Environment**
2005 - 2020	▪ 500 elementary school students die from hamburger poisoning ▪ All beef animals and products are destroyed ▪ Politicians seek a quick fix – but two weeks later, the problem remains ▪ Failure to warm public appropriately – then a problem arises ▪ Media relations with government and industry deteriorate rapidly ▪ Relations become adversarial ▪ Government and industry maintain too tight controls ▪ An expose is aired which is inflammatory and ill-informed	▪ A completely unanticipated outbreak of human disease that was traced to chickens ▪ Parrot gets avian flu… it is transmitted to humans ▪ Public convinced (though the evidence is not clear) that the disease is linked to pet food and pets… and transmitted to humans ▪ All pets are destroyed

	Economic Impact	**Education & Skills**
2005 - 2020	▪ Zero immigration policy ▪ Someone figure out that MAD is good for the environment… but who believes it? ▪ MAD results in beef shortages, increased prices, increased CPI, increased inflation	▪ Zero/negative population growth due to a fertility disease ▪ Zero immigration policy

8.5 'Eye of the Storm'



Vision of this Scenario

- Starting point – moderate to low levels of public anxiety.
- Perhaps because people are worried about other things – animal health is low on their list of worries.

Or

- There has been a shift away from the consumption of animal protein

- There is a plentiful supply of high quality and tasty protein
- Open and transparent, participatory process for scientific progress and regulatory policy-making
- Personal privacy and proprietary details are protected for data while available for analysis and risk assessment
- Adequate and effective public outreach and education
- Higher level of science literacy and more of public literate in science
    - Educational modules and teachers qualifications include science/risk education… K-12 right through to college level
- Visible, trusted & credible sources of scientific information available from government, industry , public, academia and media
- Options for personal involvement in preparedness, response and recovery
- Alignment around public health goals, e.g. industry, government and consumers have aligned to produce the roadmap document, "*Healthy Animals/Healthy People 2020*"

- Note: additional dimensions can be considered… e.g. economic as third dimension

- Prompt decision-making and action to address emerging issues and limit impact
- Sophisticated preventative program that includes options for quick action in the face of outbreaks … with engagement of law enforcement
- Systems approach to applying technology from farm-to-table across commodities
- Advances in public health means that transmission to people is lower
- Shifted to other types of agriculture where people have high confidence levels
- Organic farming
- Low intensity agriculture

Technology

- Application of technologies to decrease human error rates
- Translation of prevention/response goals/object to operational level
- Biosensors – automated responses
- 'Easy Pass' – captures transport data

- Neuroscience, psychology, behavioral sciences have contributed to improved communication and behavior changes
- Immuno-protection is safe, effective, rapid and prompt
- Differential diagnostics – vaccination, disease, exposure, resolution)
- Ongoing, aggressive applied research
- Have learned from many cases and incorporated lessons (trial & error)
- Genomics
- Natural resistance/immunity
- New processes for utilization of protein/nutrients for variety of applications – fuel, food, fiber
- NO waste
- Improved cross-cultural communications, multi-lingual education, involvement of agricultural/food systems workers as part of solution
- Also to hobbyists, 4-H, etc.

Economics

- National Continuity of Operations Planning
- Widespread understanding of economic choices and trade-offs of action/inaction…importance of business continuity
- Relationships between agriculture and other industries (tourism, medical care, etc.) understood.

Policies

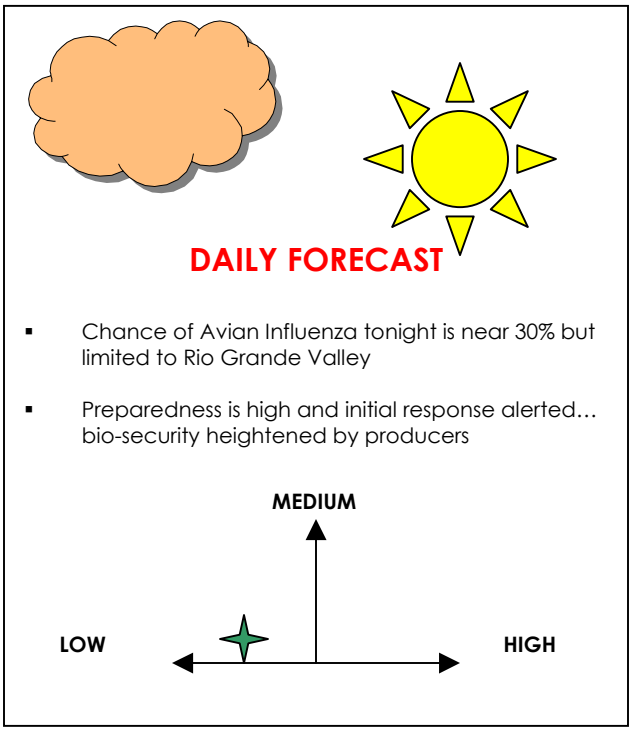
- International response plans that integrate agriculture, health, and environmental agencies and objectives
- Well understood and practiced chain of command
- Culture of harmonization and collaboration within government, between countries and with stakeholders
- Regular test exercises to identify gaps, train responders, uncover vulnerabilities – spirit of continuous improvement
- Policy-makers invest money strategically to increase scientific literacy, research, risk analysis
- Increasing priority of global food safety systems and increasing protection and defense
- Align international public health policies with agricultural policies to address global hunger and food needs
    - The right foods as well as sufficient food

Leadership

- Policy briefs on critical infrastructure provided to facilitate leadership after change and avoid disruptions in leadership
- International industry/ government/consumer coalition drives policy briefing on critical infrastructure
- Anchored commitment to basic animal health/public health goals
- Multinational companies (and their stockholders) push global leadership in context of presence in multiple countries and collaboration… IPPC, CODEX, OIE, FAO, WHO… etc.

Public/Media Response

- 'Forecasting' helps industry and public anticipate… like the nightly weather program
- Forecast captures protected data – including transport
- Goal is to provide key information to help producers/processors – and maybe even the public – to take preventive actions
- Media accepts responsibility for the message



Wild Card

A global pandemic – Avian Influenza with human to human transmission. The 'Perfect World' is not bullet-proof, but it is resilient.

BACKCASTING – 'Eye of the Storm' Scenario

	Science & Technology	Policy & Regulations
2010 - 2020	▪ New, proven technologies in diagnosis and treatment, surveillance, immunization, sanitation, etc. ▪ New cadre of trained researchers/scientists in applied disciplines ▪ Global technology transfer (global extension service)	▪ Stovepipes are broken down… "It's all about animal and public health." ▪ Development of true public/private partnerships for food system…(Red Cross, CG Auxiliary) ▪ Farmed salmon response plan for US/Canada revealed
2005 - 2010	▪ Opportunism… ▪ Aggressive funding of applied research ▪ Industry/government/academic partnerships ▪ Resource/nutrient utilization	▪ Policy research… ▪ Evaluation of models for public involvement, policy formulation and effective implementation ▪ Funds for creation and training of veterinary reserve corps...

	FOSTER LINKS …. SCIENCE &	POLICY … PUBLIC HEALTH
	▪ Search for and recognize alternatives to MAD ▪ Feeding data to researchers, validating new technologies ◄► ▪ Sharing information so "people no longer serve as sentinels for animals."	▪ Fund annual biological test exercise in every state for global food system protection and defense ▪ Push toward regional response plans…multi-state, multi-country ▪ Full funding/lab networks

	Public Attitudes	**Public Health & Environment**
2010 - 2020	▪ Celebrate successful prevention & effective response ▪ Create guiding coalition to help affect change… *"Healthy Animals, Healthy People 2020"*	▪ Deploy newly trained professionals strategically… ▪ Understand environmental and economic impacts of MAD for optimal utilization of animals/protein
2005 - 2010	▪ Sell prevention/preparedness in "teachable moments" ▪ Scenario planning with broad participation to increase awareness and buy-in for change ▪ Create sense of urgency ▪ Demonstrate availability of options	LINK TO SCIENCE & TECHNOLOGY & POLICY & REGULATIONS ▪ Disseminate message of global public health collaboration through WHO and OIE ▪ Global food industry promotes "It's all about animal and public health."

	Economic Impact	Education & Skills
2010 - 2020	▪ Greater investment in surveillance and best practice implementation. ▪ Higher value and price of food.	▪ Corps of multi-lingual animal/public health educators distributed worldwide to promote risk-based consideration of multiple. alternatives to MAD to protect global food system and economic stability of US/Canada.
2005 - 2010	▪ Recognition that the economics are different for different diseases in different countries/communities ▪ Develop tools to capture 2nd, 3 rd order economic/societal impacts in order to guide public policy (global, holistic, systematic) ▪ Canada/US and multinational companies recognize the self-interest in enhancing global food system protection and defense.	▪ International response teams to foster consideration of options/implement feasible options. ▪ Grass roots education in schools/colleges, industry and government toward more science literacy and understanding of impacts and options. ▪ Skills: enhance rapid containment ▪ Leverage government/private funds to forge new educational programs and curriculum in veterinary schools, agricultural schools and schools of public health.

9. 0 CONCLUDING COMMENTS

All participants were invited to share their 'take home messages' and make final comments. The notes below summarize the major points.

- Groups all needed some kind of 'catastrophic event' to move forward, to spark government, industry, academia collaboration.
- Felt a need to double efforts to look at industry for solutions, … academic world needs better synergy…prevention – how can we develop the sense of urgency, commitment, seeing the value of food & agriculture. Seeing experiential knowledge, gaming environment… as a tool.
- Food is worth more than you think. Saw commonalities from different futures… the era of cheap food will end, reverting to historical patterns of more expensive food.
- Added the word 'strategic' to all the flip charts – when looking at a cascading series of events leading to the negative scenarios, it seemed that they all involved people looking parochially at problems, short-term, profit-loss. Need to work collaboratively across lines with other sectors… need a way to invest strategically to achieve long-term goals. Is it politically or economically possible? May need to use events as drivers… "targets of opportunity" to get message out or derive policy from a situation.
- Yesterday talked about global deployment, shared response. Today's exercise – first 2 groups focused on US/North America. International meetings are often glacial in moving forward. So… should we be aspiring to a global response or start locally… and then bring rest of globe with us.
- This meeting was not what was expected. Thought it was to try to identify some alternatives to mass destruction. Doesn't think he can point to any solutions here. MAD is a dull knife when it comes to treating disease… Take home message is that most important thing is prevention…partnering with industry to make sure you have the tools to prevent MAD.
- Was struck by the story of the vet students being offered a bucket of chicken – properly cooked and safe, but coming from a flock infected with Avian Influenza. Fully 2/3 of students wouldn't eat it. So the issue – even with a supposedly educated population – is perception… how do you convince people of safety, and how to get away from mass destruction?
- It's fun to spend time in the future – impressed with how well the group adapted, need to practice to get better.
- Meeting offered a fascinating exploration of issues, close look at optimizing animal resources, multi-disciplinary group. Wide variety of opinions among veterinary community… what might come of it? A document that could fuel public-government debate and lead to the development of new science-based policies.

- As a foresight practitioner but not a substantive expert in the subject matter – how is the foresight methodology playing out? Developing greater proficiency. Partly due to team, partly due to skill in bringing participants to the table. Looking for divergence in the process… the edge of plausibility… allowed us to shift from 'what if' … pleased with the results.

- As an economist – now know better how much better prepared we need to be, how much more coordination might be needed between sectors.

- Surprised as time passed… all come from different backgrounds, but saw the same challenges, need to make sure we have all the disciplines to the table. Don't know how we can get that cooperation… challenges of competition between agencies, scientists, etc. for the common good. Can we do it on a larger scale… this is a starting point. Need to capitalize on private industry, fold them into the process.

- Interesting to see governments and agencies trying to find solutions before an outbreak rather than running afterwards… not sure it could be done in every country.

- Shocked to see that – even with the diversity of backgrounds – there were not more contradictions. Thought there would be more. Challenge is how to take what we learned here and do our bit better. We are the leaders. I know what I can do within my organization – I challenge you to see what you can do within your own organization.

- Thrilled to see the receptivity to discussions of risk communication. Perhaps we should all try to note what each of us could do to make this future happen. Need to change our strategy to help people understand there is no zero risk. Norm helped him understand that our focus on country disease freedom is another way of fooling the public into thinking we have less risk.

- We get so busy in our day to day lives – it was an interesting opportunity to be able to step back and think about the future and identify options. We are all guilty of moving within our comfort level – and we move to what we know. In the example of Foot and Mouth Disease – perhaps the government panicked and turned to MAD. This event gives us an opportunity to practice our responses – need to plant the seed of some of these changes in my organization to get them to change their practices. Need more outreach between our own groups – before we start educating other groups and especially the public. Key issue is technological advances – especially rapid diagnosis and response techniques. Need to push that.

- It is easier to love mankind than to love your neighbour, its easier to think globally than to act locally. I want to use the ability to look into the future to find solutions … we all have many allies if we look at a future that far away. Need to start working with them now. Need to celebrate successes, we do have examples of good control of animal diseases, but it has been done quietly – without drama. So we don't hear about it, no media interest. Also, there is risk to food companies and to government in using a non-MAD process.

- Feel a bit worried, and a greater sense of urgency. Almost all of us put our dots in the upper-left corner… how close to the precipice are we? Need to move in another direction… but we have a long way to go. How to we approach our next steps?

- Industry believes there is indeed a sense of urgency. In the beef sector the *E-coli* conference tried to gather together all the producers – and produced a document, best practices, and an attempt to do their part. This is the same – MAD can put their comments to it, but need to get the best practices started… maybe a summit … a plan can come out of that. It will build momentum. It will grow beyond large business, large government, drives change to smaller players and to the consuming public – from the old to the young. Built on the need for all of us to do our part within our own agencies and communities. Need a best practices summit quickly to make it happen.

Summary of Norm Willis' closing comments.

Thanks to all participants for giving time and thoughts. I stand in awe of the talents here – these are indeed the leaders. Over the course of the project over 50 people have contributed. This group's energy and buy-in is impressive… and there is no resistance to change. I consider John Clifford and Brian Evans have placed a trust in the project – it's a difficult question we are addressing. They've trusted that the project will take us some where that they can't get in any other way. It will not be a single step, and I agree that there is a sense of urgency. Everything starts with an idea… we try to move it ahead incrementally. We increase the communication, the transference of the message and the impact. I believe that you do what you can, and build on that. From this project we can build a model for North America and move outwards from there. What we are trying to do is carry a message forward, create the ground work, prepare for a trigger event. The obligation now is to take all these thoughts and distill out what the simple clear message is to carry forward. That is what must go to the decision makers. This is an obligation that we are picking up with this… what you've given will go forward.

Next steps: we will take everything we've heard and search for the common messages that will create a picture, a vision, and in the most ideal sense, a paradigm. That this is a change that can be considered… this is a different way of approaching this problem. Hopefully this will be a first step in a longer, broader process that will carry the message forward and outward.

Now know we wouldn't get to where we need to be without adopting a new way of thinking. My thanks to the Foresight team for helping to guide us.

Again, thank you. The results of this meeting will come back to you in the form of a report. Once our final messages have been approved, we'll release that report to you.

Meeting adjourned.

APPENDIX A

2005 IWADA Animal Health Foresight Project – Sponsors

Dr. Brian Evans

Chief Veterinary Officer for Canada

Dr. John Clifford

Deputy Administrator of Veterinary Services
United States Department of Agriculture

APPENDIX B
2005 IWADA Animal Health Foresight Project – Team Members

Sponsor Representatives

Dr. Norman Willis

President
The Norm Willis Group

Tel: 613 736-8697
nwillisgrp@on.aibn.com

Ms. Carol Tuszynski

Center Leader
Center for Emerging Issues
Veterinary Services
United States Department of Agriculture

Tel: 970 494-7320
carol.a.tuszynski@aphis.usda.gov

Core Team

Dr. Fonda Munroe

Team Leader
Information & Analysis Team
Canadian Food Inspection Agency

Tel: 613 225-2342 ext. 3818
fmunroe@inspection.gc.ca

Dr. Will Hueston

Director, Center for Animal Health & Food Safety
University of Minnesota

Tel: 612 625-8709
huest001@umn.edu

Foresight Consultant & Advisory Team

Ken Andrews

Facilitator, High Impact Facilitation

k.j.andrews@rogers.com
Tel: 613 836-1740
Cell: 613 614-4430

Steffen Christensen

Research & Technology Advisor

idyll@rogers.com
Tel: 613 237-7031
Cell: 613 878-3141

Don Simpson

Senior Foresight Advisor, Innovation Expedition

dsimpson@innovationexpedition.com
Cell: 519 870-8342
London Office: 519 439-2470
Victoria Office: 250 477-5492

Jack Smith

Director, Science & Technology Foresight, Office of the National Science Officer, Privy Council Office of Canada

jesmith@pco-bcp.gc.ca
Tel: 613 957-5346
Cell: 613 866-9768

Lynelle Spring

Project Communications
SpringWorks Consulting

lynelle@springworks.ca
Tel: 613 596-9848
Fax: 613 596-0366

APPENDIX C

Minneapolis Meeting – Invited Participants

Marianne Ash

Bio-Security & Preparedness Planner
State of Indianna Board of Animal Health

Tel: (317) 227-0347
Fax: (317) 227-0368
Cell: (765) 427-7113
mash@boah.in.gov

Theresa Bernardo

Director, Information Technology Centre
Associate Professor, Epidemiology
Michigan State University
College of Veterinary Medicine

Tel: 518 353-5551
Fax: 517 432-2937
tbernard@cvm.msu.edu

Heather C.F. Case

Clinical Instructor, Post Doctoral Fellow
Veterinary Public Health
Center for Animal Health and Food Safety
University of Minnesota

Tel: (612) 625-2750
Cell: (612) 616-2691
Fax: (612) 624-4906
frag0007@umn.edu

Buddy Ferguson

Information Officer
Policy & Communications
Minnesota Department of Health

Tel: (651) 215-1306
Cell: (651) 295-1071
Fax: (651) 215-1317
buddy.ferguson@health.state.mn.us

Cecile Ferrouillet

Clinical Instructor, Post Doctoral Fellow
Veterinary Public Health
Center for Animal Health and Food Safety
University of Minnesota

Tel: (612) 625-2750
Fax: (612) 624-4906
ferr0177@umn.edu

John Fetrow

Dipomate, ABVP:Dairy
Professor
Department of Clinical and Population Sciences
College of Veterinary Medicine
University of Minnesota

Tel: (612) 625-3776
Fax: (612) 625-6241
fetro001@unm.edu

Kent Fowler

Veterinary Medical Officer, Emergency Programs
Department of Food and Agriculture
Animal Health and Food Safety Services
State of California

Tel: (916) 653-2215
Cell: (916) 837-4319
Fax: (916) 653-2215
kfowler@cdfa.ca.gov

David A. Halvorson

Extension Veterinarian – Avian Health
College of Veterinary Medicine
University of Minnesota

Tel: (612) 625-5292
Fax: (612) 625-5203
halvo002@umn.edu

Lawrence E. Heider

Executive Director
Association of American Veterinary Medical Colleges

Tel: (202) 371-9195 x11
Fax: (202) 842-0773
leheider@aavmc.org

Beth Lautner

Center Director
U.S. Department of Homeland Security
Science & Technology

Tel: (631) 323-3207
Cell: (515) 480-5918
Fax: (631) 323-3295
Beth.Lautner@dhs.gov

Tom McGinn

Department of Homeland Security
IAIP

Tel: (703) 883-6649
tmcginn@mitre.org

Warren Mirtsching

Vice President
Food Safety and Quality Assurance
Swift & Company

Tel: (970) 506-7772
Cell: (970) 590-0995
Fax: (970) (506-8339
wmirtsching@swiftbrands.com

T.J. Myers

U.S. Department of Agriculture
APHIS

Tel: (301) 734-7677
thomas.j.myers.@aphis.usda.gov

Kenneth Petersen

Acting Deputy Assistant Administrator
USDA, Food Safety and Inspection Service
Office of Field Operations

Tel: (202) 720-5190
Fax: (202) 720-5349
kenneth.petersen@fsis.usda.gov

Emmit L. Rawls

Professor
Agricultural Economics
The University of Tennessee
Agricultural Extension Service

Tel: (865) 974-7271
Fax: (865) 974-4829
elrawls@utk.edu

Michael C. Robach

Vice President
Corporate Food Safety and Regulatory Affairs
Cargill

Tel: (952-742-0145
Fax: (952) 742-5216
mike_robach@cargill.com

Timothy L. Selnow

Professor
Department of Communication
North Dakota State University

Tel: (701) 231-7784
Fax: (701) 231-7784
tim.sellnow@hdsu.edu

Jack Smith - S&T Foresight for National Science Advice

iii. Ken Andrews - Meeting Process & Assumptions

iv. Tim Selnow - Best Practices in Risk Communication

Disposal Alternatives (IWADA)

Animal Health Foresight Project

Minneapolis, Minnesota

March 23-24, 2005

Dr. Norman Willis

Technology - Mass Burial

Technology cont'd

- PYRES
- RISKS
  Smoke,
  Noxious odors,
  Dioxins

IWADA….

…. is not traditional emergency preparedness or response

IWADA…

…moves forward to open future doors of opportunity and understanding which will support, enhance, and anticipate emergency disease management with additional tools

2000 Workshop

- Factors driving change:
  - Logistical control and economic considerations
  - Societal pressures
  - Existence of viable disease control alternatives
  - Limitations of some current mandated approaches
  - Need for balance and flexibility in control programs

2000 Workshop cont'd

- Factors driving change:
  - Animal welfare considerations
  - Environmental considerations
  - More effective use of resources

2000 Workshop cont'd

- Themes:
  - Social, ethical and cultural concerns
  - International trade and finance considerations
  - Disease control and eradication factors
  - Environmental considerations

2000 Workshop cont'd

- Criteria that any alternative must meet
- Recommendations

2002 Workshop

- Recommendations
  - Disease based approaches
  - Technology based approaches
  - Species based approaches
- Action Plan

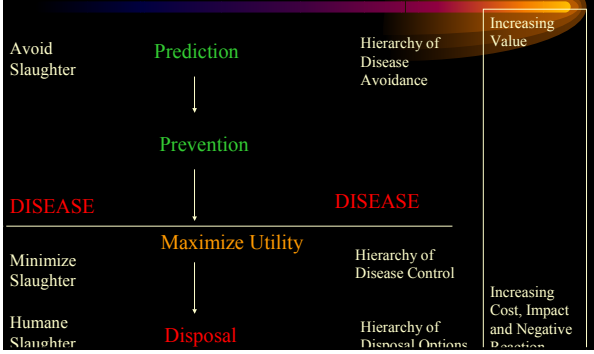
2002 Workshop cont'd

- Led to……
- Pathways Forward document
  - Eight critical pathways

2002 Workshop cont'd

- Led to…..
- A hierarchy of values
  - A conceptual approach to decision making

Animal Depopulation and Disposal Alternatives: Decision Making



2004 Workshop

- Four of the eight critical pathways examined
- 15 recommendations produced

This Foresight Project is one Pathway

- Principles:
  - Disease control must always be considered first
  - Allow animals to reach the original purpose for which they were bred
  - Humanely achieve the highest possible value from these animals

Status to Date

- Anticipation (prediction) group established under Dr. Fonda Munroe (Canada)
- Leadership training modules established under Dr. Will Hueston (USA)
- Concept paper on vaccination established by Dr. Rob Williams (Australia)

Mission of this Meeting

- Develop plausible alternatives to the mass depopulation through "stamping out"
- Provide CVOs with a greater number of options for decision making

Challenges

- To think of an approach that has not been thought of before
- What have we missed

The Approach for this Meeting

The Tools of Foresight Technology

Future Steps

Science & Technology Foresight

Jack Smith,
Director S&T Foresight,
Office of the National Science Advisor of Canada

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What is Foresight?

FORESIGHT IS NOT ...
- A forecast
- A prediction
- A strategic plan

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What is Foresight?

FORESIGHT IS NOT ...
- A forecast
- A prediction
- A strategic plan

FORESIGHT IS a set of tools for anticipating the future...
- Anticipates **multiple, plausible** futures
- 5 – 25 year time horizon
- A rehearsal for potential futures
- Accommodates uncertainty & diversity
- Highlights emerging opportunities & threats

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Why is Foresight a Powerful Tool?

- **Prepares** us for change
- **Engages** multiple stakeholders across many disciplines
  - Builds networks, & communities of interest & practice
- **Educates** leaders, communicators & the public

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Why is Foresight a Powerful Tool?

- **Prepares** us for change
- **Engages** multiple stakeholders across many disciplines
  - Builds networks, & communities of interest & practice
- **Educates** leaders, communicators & the public
- **Identifies**
  - Potential societal threats, vulnerabilities & opportunities
  - Critical, emerging science & technology
- **Activates** our early warning radar
  - Highlights the significance of apparently minor events

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Foresight Outcomes

Social, economic & environmental benefits from...
- Stronger multi-disciplinary networks
- Improved institutional preparedness
- Better decisions...more robust policy
- Increased competitiveness
- Greater agility, speed in responding to change

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Who's using Foresight today?

Government

Researchers

ARC CNRC Canada

Industry

Shell

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Foresight Process Overview

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses
↓
Answer Challenge Questions
↓
Identify Change Drivers
↓
Select Critical Drivers
↓
Identify 4 Scenarios
→ Populate Each Scenario
↓
Backcast to 2005
↓
Synthesis & Recommendations

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Foresight Process

Define Project Topic

- *Ensures focus*
- *Defines boundaries*

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Foresight Process

Define Project Topic
↓
Review Current Situation

- *Scoping exercise*
- *Understand current problems*

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Foresight Process

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses

- *Lenses are critical perspectives*
- *Look at the problem from <u>every</u> viewpoint*
- *Avoid tunnel vision*

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Foresight Process

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses
↓
Answer Challenge Questions

- *Challenge Questions are mechanisms to begin exploring future possibilities*
- *Encourages us to imagine*

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Foresight Process

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses
↓
Answer Challenge Questions
↓
Identify Change Drivers

- *Things that cause change*
- *Positive or negative*
- *Low or high uncertainty*

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Foresight Process

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses
↓
Answer Challenge Questions
↓
Identify Change Drivers
↓
Select Critical Drivers

- *Choose high impact/high uncertainty drivers*
- *Low uncertainty drivers are considered predictable… background noise*

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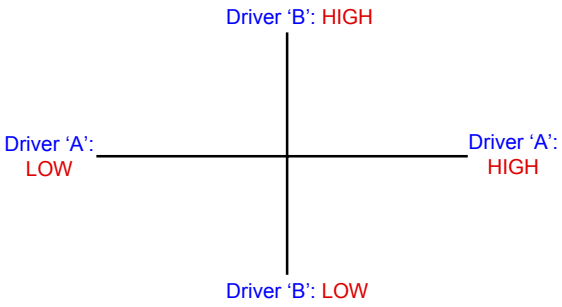
Construct Driver Axes



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Foresight Process

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses
↓
Answer Challenge Questions
↓
Identify Change Drivers
↓
Select Critical Drivers
↓
Identify 4 Scenarios

- *Scenarios are plausible stories that describe a future*
- *Can be positive or negative*
- *Each scenario should be different – a range of possibilities*

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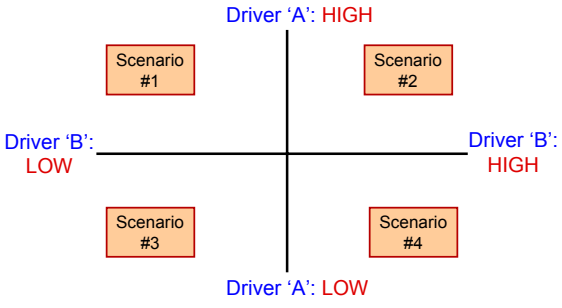
Define Foresight Scenarios



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Foresight Process

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses
↓
Answer Challenge Questions
↓
Identify Change Drivers
↓
Select Critical Drivers
↓
Identify 4 Scenarios
→ Populate Each Scenario

- *Imagine you are in the year 2020*
- *Breakout groups use questions derived from the Lenses to construct future Scenarios.*
- *e.g. "What kind of policies dominate this scenario?"*

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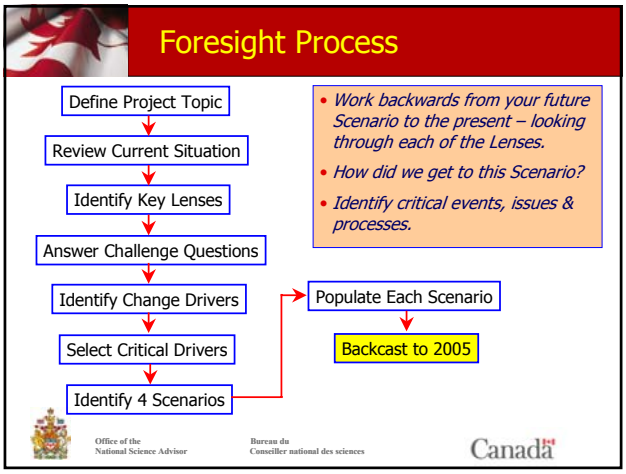
Foresight Process
Define Project Topic
Review Current Situation
Identify Key Lenses
Answer Challenge Questions
Identify Change Drivers
Select Critical Drivers
Identify 4 Scenarios
Populate Each Scenario
Backcast to 2005
• Work backwards from your future Scenario to the present – looking through each of the Lenses.
• How did we get to this Scenario?
• Identify critical events, issues & processes.
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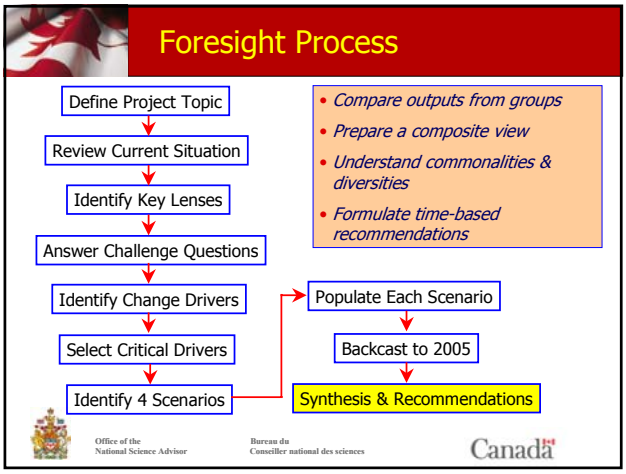
Foresight Process
Define Project Topic
Review Current Situation
Identify Key Lenses
Answer Challenge Questions
Identify Change Drivers
Select Critical Drivers
Identify 4 Scenarios
Populate Each Scenario
Backcast to 2005
Synthesis & Recommendations
• Compare outputs from groups
• Prepare a composite view
• Understand commonalities & diversities
• Formulate time-based recommendations
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Animal Health Foresight Project

Minneapolis, MN

March 23-24, 2005

Workshop Format

- I4: Innovative Informative
  Interactive Informal
- Facilitator: Not subject matter expert
  Optimize I4
- You are a "diverse group of informed, collaborative stakeholders"
- Foresight: Exchange views on a number of prospective future scenarios

Guidelines

No 'boxes'

No cell-phones

No solutions

No speeches

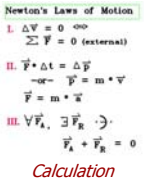
Who Needs to Plan Ahead?

What Forward-Looking Tools Have Been Available?

What Forward-Looking Tools Have Been Available?

Observation

Super-Computers



Calculation

Extrapolation

Assumptions

- *There is increasing societal concern in many countries about the continuing viability of broad depopulation as the preferred method of dealing with critical situations involving animal diseases. It is now important that leading animal asset management nations anticipate various future contingencies with alternative strategies for disease management among animals.*
- *The increasing potential for major disease events demands the availability of a range of response strategies, in the absence of which, mass destruction will continue and predominate.*
- *The OIE has been successful in developing international standards for trade based on the latest scientific information. Any new approaches for animal disease control will seek to have the OIE incorporate them into international standards.*
- *The primary objective of any alternative strategy must always address disease containment first.*

Workshop Objectives

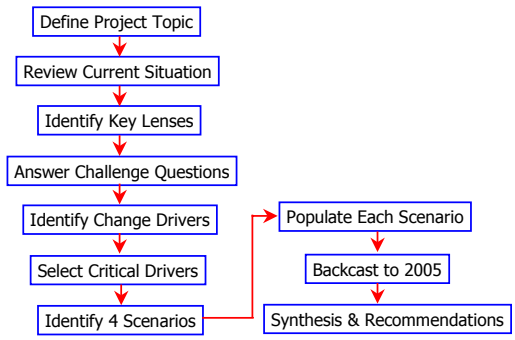
"The formulation of alternative options for effective disease control without mass depopulation, which could be provided as advice to the Chief Veterinary Officers of Australia, New Zealand, USA and Canada."

Sponsors: Dr. Brian Evans, CVO, Canada
Dr. John Clifford,
Deputy Administrator of Veterinary Science, USDA

Process & Agenda

- Wednesday - Orientation on the Foresight process
  - Challenge Questions: explore topics together
- Thursday - Scenario development: future options
  - Backcasting: implications today
  - Next steps in the process
- Combination of small group brainstorming & plenary discussion
- Creative forward thinking, not solutions for today's issues
- Consensus is not required or expected:
  it's OK to agree to disagree
- What's brainstormed here ..... stays here

Foresight Process Overview



Animal Health Foresight Project

Define Project Topic

- *Find alternatives to MAD (Mass Animal Destruction)*

Animal Health Foresight Project

Define Project Topic

Review Current Situation

- *Why is MAD bad?*
- *Who are the stakeholders?*
- *How are problems managed today?*

Animal Health Foresight Project

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses

- ***Public Attitudes*** – *fear, anxiety, mistrust*
- ***Public Health & Environment*** – *animal disposal, zoonotic potential*
- ***Science & Technology*** – *tracking, containment, diagnosis, prevention*
- ***Education & Skills*** – *technical, veterinary, communications*
- ***Policy & Regulation***
- ***Economic*** – *industry losses, trade issues*

Animal Health Foresight Project

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses
↓
Answer Challenge Questions

- *Knowledge, Information Management & Skills*
- *Economics & Trade*
- *Advances in Science & Communications*
- *Policy & Regulation*

Challenge Questions: Plenary Discussion

Knowledge, Information Management & Skills:
In the world of 2020

- *Knowledge sharing & emergency response to animal disease crisis are both highly effective on a global scale. How?*
- *What new skills & training priorities have made the greatest contribution to innovative alternatives to MAD?*
- *Today, every animal in the food supply is individually tracked. What attributes does this tracking technology have?*

Challenge Questions: Breakout Session

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses
↓
Answer Challenge Questions

- *Knowledge, Information Management & Skills*
- *Economics & Trade (E+T)*
- *Advances in Science & Communications (S+C)*
- *Policy & Regulation (P+R)*

- *Select the topic area most interesting to you*
- *Discuss your Challenge Questions in your breakout team*
- *Report & plenary discussion*

Animal Health Foresight Project

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses
↓
Answer Challenge Questions
↓
Identify Change Drivers

- Rate & cost of technical innovation
- Public anxiety
- Quality of communications
- Animal welfare advocacy
- Industry advocacy
- Environmental impacts
- Level of animal optimization
- Regulatory agency capacity
- Terrorist threat potential
- Trade & production economics
- Public health
- Marginalization of veterinary decision-makers
- Absence of global response

Selecting Critical Drivers

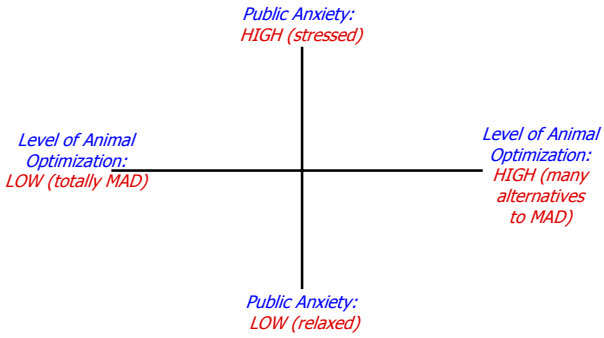
Drivers	Impact	Uncertainty	Total
Driver (A)	**5**	**3**	**8**
Driver (B)	1	2	3
Driver (C)	1	1	2
Driver (D)	**4**	**5**	**9**

Animal Health Foresight Project

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses
↓
Answer Challenge Questions
↓
Identify Change Drivers
↓
Select Critical Drivers

- Rate & cost of technical innovation
- **Public anxiety**
- Quality of communications
- Animal welfare advocacy
- Industry advocacy
- Environmental impacts
- **Level of animal optimization**
- Regulatory agency capacity
- Terrorist threat potential
- Trade & production economics
- Public health
- Marginalization of veterinary decision-makers
- Absence of global response

Construct Driver Axes

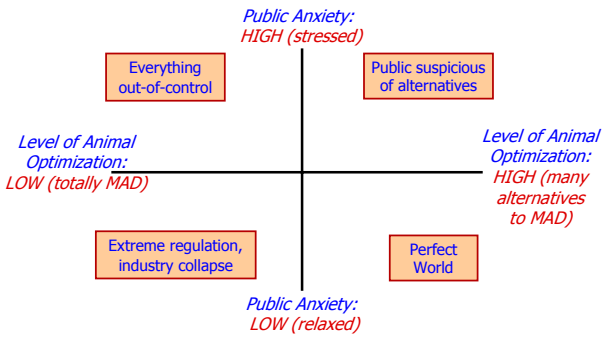


Animal Health Foresight Project

Define Project Topic
↓
Review Current Situation
↓
Identify Key Lenses
↓
Answer Challenge Questions
↓
Identify Change Drivers
↓
Select Critical Drivers
↓
Identify 4 Scenarios

- *Scenarios are plausible stories that describe a future*
- *Can be positive or negative*
- *Each scenario should be different – a range of possibilities*

Identify Scenarios



Animal Health Foresight Project

Define Project Topic
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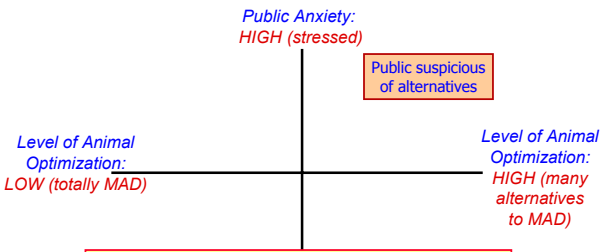
Identify 4 Scenarios

→ Populate Each Scenario

Scenario Population: Plenary Discussion



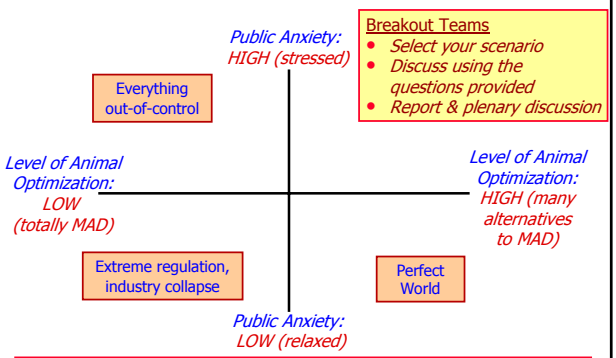
Plenary Discussion on this Selected Scenario

- *What are the reasons for the public's anxiety level?*
- *What technologies support or drive this scenario?*
- *How are economic choices made in this scenario?*

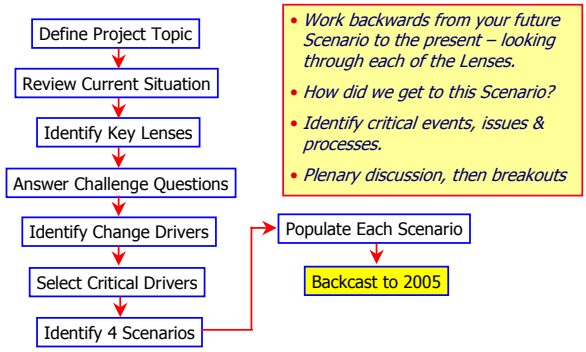
Questions to Help Build a Scenario

1. Discuss reasons for the public's anxiety level.
2. How are economic choices made in this scenario?
3. What technologies support or drive this scenario?
4. What kinds of policies dominate this scenario?
5. What style & sources of leadership are required or support this scenario?
6. How do the public and media respond when a crisis occurs?
7. What are the roles for government, industry and other stakeholders?
8. How would the wildcards affect this scenario?
9. Name Your Scenario – capture the theme, impact, flavour

Scenario Population: Breakout Teams



Animal Health Foresight Project

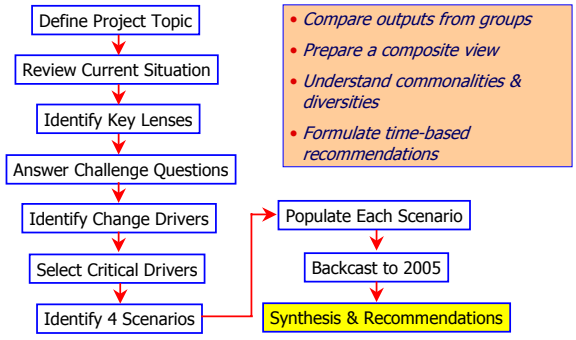


Scenario Backcasting Template

TIMELINE	LENS (A) (Science & Tech)	LENS (B) (Policy & Regulations)
2010 - 2020	➢ ➢	➢ ➢
2005 - 2010	➢ ➢	➢ ➢

Lens (C): Public Attitudes
Lens (D): Public Health & Environment
Lens (E): Economic Impact
Lens (F): Education & Skills

Animal Health Foresight Project



Best Practices in Risk Communication

National Center for Food Protection and Defense

Best Practices of Risk Communication and Foresight

- Where are we now?
- Toward what are we working?
- What must we be prepared to do?

Where are we now?

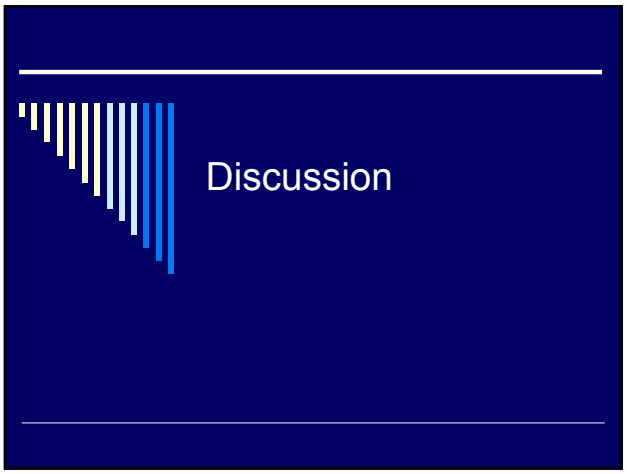
- Pre-event planning
  - logistics
- Collaborate and coordinate with credible sources
  - networks and partnerships
- Accept uncertainty and ambiguity
  - do not over-reassure ourselves or the public

Toward what are we working?

- Forming partnerships with the public
  - stakeholders
- Listen to the public's concern
  - perception is reality
- Be honest, frank and open
  - virtue

What must we be prepared to do?

- Meet the needs of the media and remain accessible
  - media as a resource vs. nuisance
- Communicate with compassion, concern and empathy
  - trust
- Provide self efficacy
  - What can I do?


Discussion

Agenda

Minneapolis, March 23-24, 2005

DAY #1 (Wednesday March 23) 1:00 – 6:00pm

Timing	*Details*
1:00 – 1:10	Welcome & meeting format
1:10 – 1:30	Introductions
1:30 – 1:55	Project overview & objectives
1:55 – 2:15	Foresight intro and process
2:15 – 2:30	Assumptions, objectives and agenda for this meeting
2:30 – 2:40	Nature break
2:40 – 2:50	Intro to Challenge Questions – process
2:50 – 3:30 3:30 – 3:40 3:40 – 4:40 4:40 – 4:50 4:50 – 5:20	a) Information Management & Skills – plenary brainstorm b) Participants self-select between: 1. Trade & Economics 2. Policy & Regulation 3. Advances in Science & Communications c) Breakout teams (x3) brainstorm responses d) Team prepares overview e) Teams report and plenary discussions
5:20 – 5:30	Parking Lot
5:30 – 6:00 6:00 -	Invited input from communications/media expert Network time, optional

DAY #2 (Thursday March 24) 8:00am – 3:30pm

Timing	*Details*
8:00 – 8:45	Overnight reflections – plenary
8:45 – 9:00	Foresight scenario overview
9:00 – 9:45	Populate scenario (X) – plenary
9:45 – 9:55 9:55 – 11:10* 11:10 – 11:20 11:20 – 11:50	a) Participants self-select scenario (x3) 1. 'Perfect World' 2. 'Over-Regulation' 3. 'Out of Control' b) Breakout teams populate scenarios c) Team prepares overview d) Teams report and plenary discussions
11:50 – 12:30	Lunch
12:30 – 12:45	Scenario backcast overview
12:45 – 1:10	Backcast scenario (X) – plenary
1:10 – 2:10* 2:10 – 2:20 2:20 – 2:45	a) Breakout teams (x3) perform backcast b) Team prepares overview c) Teams report and plenary discussions
2:45 – 3:15	Take-home messages – plenary
3:15 – 3:30	Closing Observations