APEC Scientific Seminar-Workshop on Food Safety Risk-Benefit Analysis

Federal Commission for the Protection from Sanitary Risks (COFEPRIS)
Ministry of Health

22-24 November 2011
Manila, Philippines

- Competent authority for regulation, control and encouragement to protect public health
- Federal agency dependent from the Secretariat of Health
- Technical and operationally autonomous

FIELD OF RESPONSABILITY

Production, commercialization, imports, exports and publicity

Medicine & health technologies
- Medical devices
- Medicine & drugs
- Herbal remedies
- Tissue transplants
- Medical services

Consumer products
- Food
- Beverages
- Tobacco
- Cosmetics
- GMOs

Toxic & dangerous substances
- Pesticides
- Fertilizers
- Chemical precursors
- Essential chemicals

Occupational health

Environmental risks

Basic sanitation

COFEPRIS OPERATIVE MODEL

International and National Legal Assistance

Sanitary Risk Surveillance and enforcement

Sanitary Risk Communication

Sanitary Risk Analytical Laboratory

Administrative staff

Impact Assessment

Epidemiologic Analysis:
Contamination of food and health impacts
Foodborne diseases (FBD) are a growing problem worldwide. There are several critical points in the process of food surveillance, which involves aspects related to the processing and handling of food as well as the characteristics of germs and their transmission mechanisms.

FDB is defined as the one episode that a person has diarrhea syndrome that is associated with food intake, by that is essential to establish an epidemiological surveillance to identify early FDB cases, prevent the spread of disease and early detection of outbreaks. (Rosa R & Castro M. Food Inocuity. IICA. 2010)

A foodborne disease outbreak is the episode in which two or more people have a similar illness after eating and / or water, linked by their origin, place of consumption or sale (excluding the cases of botulism, red tides, and Amanita phalloides poisoning)

In worldwide recognizes two major types of food-intake diseases transmitted:

Intoxications
Intestinal Infections

Both terms has been used to refer a FBD, however is convenient to be more specific

The most common diseases that have been identified as caused by contamination of food are:

- Those caused by microorganisms's toxins (Staphylococcus aureus y Bacillus cereus)
- Toxins from some fish (increasing histamine levels) or cause local damage such as Clostridium perfringens
- The greatest group of intestinal infections that includes viruses, bacteria and parasites (like E. coli, Hepatitis A, salmonellosis, shigellosis, toxoplasmosis, viral gastroenteritis (rotavirus and others), amebiasis, taeniasis, trichinosis, vibrio and others)

WHO has reported that 88% of cases of diarrhea worldwide are attributable to: sanitation, potable water availability and hygiene behaviors (particularly within the household (Corvalan and Prüss-Üstün, WHO 2006).

Globally, in 2004 reported that about 1.5 million deaths from diarrhea (mainly in children under 5 years), were attributed to environmental factors, mainly water, sanitation (excreta disposal and drainage systems) and poor hygiene (Corvalan and Prüss-Üstün, WHO 2006).

In the european child population, these factors have been evaluated and determined that 5.3% of deaths from diarrheal disease is caused by the consumption of water of poor quality and inadequate sanitary measures (Sartor et al 2016)

In 1997…

<table>
<thead>
<tr>
<th></th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing countries</td>
<td>17.2 mths</td>
</tr>
<tr>
<td>Undeveloped countries</td>
<td>120 thousand</td>
</tr>
</tbody>
</table>

(INSP. Urban Survey of Food and Nutrition in the Metropolitan Area of Mexico City. 2002)

Some age ranges are specially susceptible. In 2000, the prevalence on children <5 years was 11.5% and in 2006 increased to 12.9% in Mexico

(INSP. Health National Survey (HNS). 2006)
• In the same Mexican survey (HNS, 2006), 11.7% of children under five years said have diarrhea (on the two weeks previous), from which almost half (49.8%) went to the doctor. By this way, the under-registry can be calculated as 1:1.

Diseases transmitted by food and water

<table>
<thead>
<tr>
<th>Illness</th>
<th>Water</th>
<th>Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholera</td>
<td>90%</td>
<td>10%</td>
</tr>
<tr>
<td>Giardiasis</td>
<td>90%</td>
<td>10%</td>
</tr>
<tr>
<td>Intestinal Amebiasis</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>Shigellosis</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>Other Intestinal infections 4</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>Typhoid fever (Salmonellosis)</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>By protozoas</td>
<td>10%</td>
<td>90%</td>
</tr>
<tr>
<td>Paratyphoid and others salmonellosis</td>
<td>5%</td>
<td>99%</td>
</tr>
<tr>
<td>Bacterial food poisoning</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*4 Other intestinal infections, 50% may be caused by bacteria and the other half by E. coli.

Unique Mexican Information System for Epidemiological Surveillance

Intestinal infections (other organisms and bad defined) cases and ratios on 32 states of Mexico, 2005-2009
APPENDIX 12

Bacterial food poisoning cases and rates on 32 states of Mexico. 2005-2009

Paratyphoid and other salmonellosis cases and rates on 32 states of Mexico. 2005-2009

Shigellosis cases and rates on 32 states of Mexico. 2005-2009

Mexican states with highest bacterial food poisoning incidence rate. 2006 -2010

Positive results reported that identify microorganism involved on human and environmental samples.

- 2003 (13%) Human positive samples
- 2003 (14%) Environmental positive samples
- 2004 (20%) Human positive samples
- 2004 (26%) Environmental positive samples
- 2005 (19%) Human positive samples
- 2005 (12%) Muestras ambientales positivas

Infectious agents mainly reported on human samples: E. coli, Salmonella spp, Y. enterocolitica, Citrobacter, Enterobacter agglomerans, Pseudomonas cepasa, Klebsiella pneumoniae, Rotavirus.

On environmental samples: E. coli, Salmonella spp, Staphylococcus aureus, Total and fecal coliforms, V. parahaemolyticc.

Gastrointestinal diseases outbreaks. Mexico, 2010

- Ciguatoxin intoxication 1%
- Mushroom intoxication 3%
- Acute Hepatitis A 58%
- Acute Gastrointestinal disease 42%
Gastrointestinal diseases outbreaks. Mexico, 2010 by occurrence site

Gastrointestinal diseases outbreaks. Mexico, 2010 by source

Times mentioned "food", "water & food" and only "water" as outbreak source

Times mentioned meat as outbreak source

Times mentioned others as outbreak source

Gastrointestinal diseases outbreaks by month. Mexico, 2010
Current epidemiological evidence is used to:

- Support the health impact assessment of different exposures
- It can be applied to a range of actions, policies or projects on various health determinants (risk management).

**Pesticide Surveillance Program, Mexico 2011**

Food consumption according to Urban Survey of Food and Nutrition in the Metropolitan Area of Mexico City (2002) and GENIS (2003) for Latin America (paprika).

Database validation removing processed foods, meat and with animal origin and only consider those with thin shell or that eat uncooked.

Matches were established by the group used as framework group (12 food). Searching those that represent 80% of paprika intake (14 food).
The pesticide import volume was determined to select those with highest probability to be found in food. From this, the most toxic pesticides were selected, determining the following “ Herbal”

|---------------------------|--------|--------|--------|-------|-------------|-------|--------|--------|--------|-------|-------------|-------|

Authorized pesticides for these were considered from Mexican Pestice Catalog.

<table>
<thead>
<tr>
<th>Culture/Pesticide</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>carbofuran</td>
<td>oxamyl</td>
<td>paraquat</td>
<td>acetochlor</td>
<td>2,4-D</td>
</tr>
<tr>
<td>Banana</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
<tr>
<td>Rice</td>
<td>carbofuran</td>
<td>oxamyl</td>
<td>paraquat</td>
<td>acetochlor</td>
<td>2,4-D</td>
</tr>
<tr>
<td>Tomato (Red)</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
<tr>
<td>Tomato (green)</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
<tr>
<td>Bean</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
<tr>
<td>Potato</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
<tr>
<td>Potato</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
<tr>
<td>Tomato (green)</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
<tr>
<td>Onion</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
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<td>Onion</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
<tr>
<td>Chili</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
<tr>
<td>Chili</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
<tr>
<td>Carrot</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
<tr>
<td>Carrot</td>
<td>oxamyl</td>
<td>propoxur</td>
<td>procarb</td>
<td>diazinon</td>
<td>glifosato</td>
</tr>
</tbody>
</table>

Rules to evaluate pesticide monitoring
1. Health risk: authorized, prohibited, y/o restricted.
2. Presence in basic consumption products.
4. Trained personnel on pesticide analysis.
5. Installations and equipment.

Proposal
1. Selection of pesticides to monitoring: organophosphate pesticides.
2. Pesticide analysis by matrix: seeds and grains.
3. Pesticide analysis by geographic zone.
4. Health state laboratories participation.
5. Train to state laboratories in methodologies according to each matrix.

Pesticides Acute Intoxications in Mexico
2006-2010
Thank you

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