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## **Pre-harvest food safety**

**Report of a WHO consultation with the participation of the Food and Agriculture Organization of the United Nations and the Office International des Epizooties.**

**Berlin, Germany 26-28 March 2001**

## **World Health Organization**

Department of Communicable Disease,  
Surveillance and Response

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## Preamble

The WHO Consultation on Pre-harvest Food Safety was held with the participation of the Food and Agriculture Organization of the United Nations (FAO) and the *Office International des Epizooties* (OIE) from 26 to 28 March 2001 at the Federal Institute for Health Protection of Consumers and Veterinary Medicine, BgVV, in Berlin, Germany.

The recommendations provide a framework to improve on-farm measures for increased safety of food of animal origin. They will support and guide national authorities in their respective activities and in the establishment of control programmes.

The Consultation is part of WHO activities to develop sustainable and integrated food safety systems for the reduction of public health risks along the entire food chain, from primary producer to the consumer. Foodborne diseases are an important cause of ill-health, have economic implications and are furthermore subject to increasing public concern. This makes pre-harvest food safety an essential element of any sustainable animal production and integrated food safety system.

During the Consultation (Annex 3, Agenda), national and international experiences gained in the implementation of pre-harvest food safety programmes and activities were reviewed. Challenges and future opportunities were highlighted. The discussion focused on those activities and measures related to farm-animal production which contribute to the protection of human health from diseases transmitted to humans via food of animal origin. This includes particularly meat and other products that are not subject to additional food processing steps.

The Consultation elected Dr Henrik Wegener as chair and Dr Patricia Desmarchalier as rapporteur. Dr Peter Braam (WHO) served as secretary. Experts from various disciplines and representatives from various international organizations and institutions having both interests and important activities in the area of pre-harvest food safety participated (Annex 2).

The challenge will be to further develop and implement pre-harvest food safety strategies. There is a clear need for reliable and well functioning pre-harvest food safety systems. These should include the reduction, prevention, control and surveillance of the public health risks in farm-animal production and should be guided by risk analysis.

Dr Peter Braam  
Dr Francois-Xavier Meslin  
Dr Guénaél Rodier

## Recommendations

### 1. General considerations

- 1.1 Improving public health by reducing foodborne illnesses requires a farm-to-table approach based on risk-analysis (i.e., consisting of risk assessment, risk management and risk communication) with a sharing of responsibilities between segments to reduce hazards.
- 1.2 Pre-harvest food safety is an important element in sustainable national food safety policies.
- 1.3 There are examples of positive correlations between the levels of foodborne pathogens in food animals and the incidence of foodborne illness in humans.
- 1.4 With increasing global consumption of animal-derived foods there is an increased potential for zoonotic foodborne pathogens (including their resistance to antibiotics) to disseminate worldwide.
- 1.5 Pre-harvest food safety must be primarily focused on the protection of human health and be considered in the context of a farm-to-table food safety approach.
- 1.6 Pre-harvest food safety programmes are needed to fulfil public health demands caused by failure of traditional food safety systems to effectively address the new and emerging foodborne diseases/emergencies, strengthen consumer confidence and/or gain market access.
- 1.7 Pre- and post-harvest food safety measures should be instituted within a risk management framework to achieve the greatest public health impact in reducing foodborne illnesses. All measures available throughout the food chain and their relative contribution to reducing risks to human health should be taken into account when considering the different risk management options.
- 1.8 Pre-harvest programmes have contributed to the overall control of classical foodborne zoonoses such as bovine brucellosis, tuberculosis, trichinosis, etc. in many industrialized countries.
- 1.9 A reduction in the recorded incidence of foodborne human salmonellosis has been reported in some countries with extensive pre-harvest *Salmonella* control programmes.

### 2. Risk assessment: Data and research needs

- 2.1 Control of foodborne disease requires reliable and standardized epidemiological data along the food chain and targeted surveys on human health may be required, particularly in developing countries.

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- 2.2 An understanding of the underlying epidemiology of foodborne pathogens, particularly emerging pathogens, is required to determine the practical and effective intervention strategies that should be implemented, particularly in the pre-harvest area. The pathogenicity of foodborne pathogens for humans should be clarified by monitoring human populations and comparing pathogens from human clinical foodborne illnesses with the pathogens present in the pre-harvest area.
  - 2.3 Surveillance data is needed for farm-to-table risk assessment. Integrated foodborne disease monitoring and surveillance programmes should include human foodborne illnesses, foodborne pathogens in food animals and foods of animal origin.
  - 2.4 Risk assessments can be used to identify data gaps and research needs and focus practical risk management and communication strategies that best address important country-specific public health problems.
  - 2.5 Further research needs include:
    - Identification of effective pre-harvest interventions for foodborne pathogens other than *Salmonella*, e.g. thermophilic *Campylobacter*, verotoxigenic *Escherichia coli*, *Yersinia enterocolitica*, *Listeria monocytogenes*
    - Measuring and documenting the contribution of pre-harvest interventions to the reduction of foodborne illness (e.g., through ongoing risk assessments)
    - Determination of which pre-harvest interventions are appropriate in an extensive production system
    - More data are needed on the advantages or disadvantages of organic farming, animal welfare measures and other alternative food animal production systems on food safety.
- 3. Risk management: Pre-harvest food safety strategies**
- 3.1 Food safety programmes, including pre-harvest food safety approaches require partnership between government, industry and consumers. Pre-harvest food safety must involve producers as partners addressing their responsibilities for food safety.
  - 3.2 Based upon risk assessment, risk managers should institute food safety measures where they achieve the greatest public health effect, taking into account all measures available throughout the food chain. The risk management process should be outcome-based, transparent and rely on sound science.
  - 3.3 Pre-harvest food safety strategies should focus on the risk to consumer health through the consumption of food of animal origin and be:
    - practical, sustainable and easily implemented,
    - written in outcome-oriented, non-prescriptive terms to facilitate the choice of appropriate country-specific risk management options,
    - horizontal with a multidisease approach whenever possible,
    - established in a transparent manner involving all stakeholders,
    - developed, implemented, monitored and evaluated in close and permanent collaboration between all stakeholders.

- 3.4 There are strong linkages between animal health management systems and pre-harvest food safety. Veterinary practitioners have expertise and responsibility in pre-harvest food safety (in addition to their animal health responsibilities).
- 3.5 Effective risk communication is essential to the success of implementing risk management strategies.
- 3.6 To be successful, pre-harvest food safety programmes should involve:
- National strategy development involving definition of targets and interventions determined by risk assessment
  - Programme development by risk managers involving all stakeholders, authorities and experts
  - Progressive programme implementation of risk management and risk communication strategies
  - Regular programme review
  - Traceability
  - Development of verification and accreditation mechanisms including third party certification processes
  - Appropriate financial support from government and industry during implementation.
- 3.8 Risk management strategies may include third party certification, documentation of plans, written procedures, producer organizations and education programmes in the pre-harvest sector that focus on priority public health outcomes. As the prevalence of foodborne pathogens and the level of indicator microorganisms decreases with improved food safety, more robust and sensitive monitoring tools are required for validation and evaluation.

#### **4. Enabling developing countries to carry out pre-harvest food safety risk management interventions**

- 4.1 The recognition of the importance of food safety by developing countries is critical to their ability to raise their domestic public health and ability to export food. Therefore developing countries should participate in the development of food safety strategies.
- 4.2 Developing countries require assistance in identifying their needs, in building their capacity to assess foodborne risks and in establishing priorities for control and prevention of foodborne diseases, as well as in implementing appropriate food safety control strategies. Local and regional partnerships and coalitions should be used to enhance their ability to address food safety from the farmer to the consumer.

#### **5. International standards setting and collaboration between international organizations**

- 5.1 The development of codes, guidelines and standards to address pre-harvest food safety hazards should be relevant to, and involve the full participation of, developing countries.

- 5.2 International organizations should work together to promote science-based approaches to pre-harvest food safety to avoid duplication and to enhance collaborative efforts to protect public (consumer) health.
- 5.3 International standards setting organizations must focus on the appropriate application of risk analysis in the pre-harvest area.
- 5.4 International organizations should consult with all interested parties, including the private sector and nongovernmental organizations (NGOs), when developing standards, guidelines and/or recommendations to address pre-harvest food safety hazards.

## **Annex 1: Summary of individual presentations**

### **1. Introduction: Food animal production**

*Samuel C. Jutzi*

Effective national veterinary public health structures need to be established/strengthened and decision support systems provided/enhanced for the control of priority zoonotic diseases.

Codes of conduct, best practices and guidelines on the application of Codex-approved food safety principles, prudent use of antimicrobials and quality control mechanisms for the production, processing and transport of livestock products using suitable biosafety principles need to be designed, agreed and enforced.

Programmes on enhanced public awareness and on the design, negotiation and enforcement of policy and regulatory measures for safeguarding sustainable quality control of food of animal origin need to be encouraged.

### **2. Experiences with dedicated pre-harvest food safety programmes: *Salmonella***

*Henrik C. Wegener*

The three main elements of pre-harvest *Salmonella* control are:

- Prevent introduction of infection
- Prevent survival and spread of infection within the herd/flock
- Reduce/eliminate an established infection.

Pre-harvest *Salmonella* control efforts can effectively control *Salmonella* from slaughter poultry and table egg production, and reduce *Salmonella* in swine production.

Pre-harvest *Salmonella* control efforts can reduce the occurrence of *Salmonella* in food for human consumption and thus reduce the risk of human foodborne salmonellosis.

Food animals constitute the main reservoir for *Salmonella* causing foodborne salmonellosis. Consequently, pre-harvest *Salmonella* control efforts should constitute an integral part of any sustainable strategy to prevent and reduce foodborne salmonellosis.

### **3. Experiences with dedicated pre-harvest food safety programmes: *Campylobacter***

*Eva Berndtson*

Food animals, especially poultry, constitute substantial reservoirs for *Campylobacter* that may cause foodborne campylobacteriosis through eating under-cooked meat or drinking unpasteurized milk.

The major efforts have to focus on pre-harvest control, as it is hard to avoid spread of *Campylobacters* during the slaughter process. Pre-harvest control by strict biosecurity at farm level may prevent *Campylobacters* from entering the food chain.

Further efforts are needed to develop completing methods for preventing (e.g. vaccination) or lowering the intestinal colonization (e.g. competitive exclusion flora or acids) of food animals to use where a total exclusion of the bacteria is limited.

#### 4. Experiences with dedicated pre-harvest food safety programmes: Zoonotic enteropathogenic *E. Coli*

*Patricia Desmarchelier*

An understanding of factors underlying the epidemiology of enterohaemorrhagic *E. coli* (EHEC) in ruminant animals is required to determine whether practical and effective intervention strategies can be implemented, particularly on-farm.

The virulence potential of STEC should be clarified by monitoring human infections and comparison of human clinical STEC with animal and food STEC. Human disease specific virulence markers are required for STEC to allow the public health significance of their presence in animals and foods to be assessed.

More robust monitoring tools for the assessment and monitoring of food safety programmes for EHEC are required.

#### 5. Experiences with dedicated pre-harvest food safety programmes: *Trichinella*

*Christian Kapel*

*Trichinella*-free production can only be conferred to pigs produced under intensive indoor conditions.

Meat of exotic animals and animals with outdoor access should always be tested.

Quality assured *Trichinella*-free production appears cost-effective only if included in multi-disease pre-harvest control programmes.

#### 6. Experiences with a dedicated pre-harvest food safety programme: Development of prudent use of antimicrobials

*A. E. van den Bogaard*

Microbiological risks of food are not only due to contamination of pathogenic micro-organisms, but also of resistant bacteria or resistance genes, that can be transferred from endogenous flora of food animals to the intestinal flora of humans via food of animal origin. Therefore a low level of resistance in the intestinal flora is considered a public health issue. The only way to reach this goal is to use less antibiotics in food animals, i.e. to use antibiotics only if necessary. Measures that must be taken in combination are:

- Establishing a policy for the use of antibiotics jointly by veterinary practitioners and specialists
- Publication of “formularia” (guidelines for antibiotic use) for food and pet animal species
- Systemic registration and analysis of patterns of bacterial resistance (not only of pathogens but of fecal flora as well) and the use (qualitative and quantitative) of antibiotics in veterinary medicine
- Regular feedback of these data to the veterinary practitioners and consultation about the efficacy of the formulary guidelines in daily practice
- Systemic monitoring and evaluation of the impact of the antibiotic policy and formularia, and, if indicated, updating of the formulary
- Continuous education of veterinary surgeons about infectious diseases and antimicrobial therapy accompanied by development of a veterinary audit system.

**7. Pre-harvest food safety: Why? What to focus on? What makes it belong to and distinct from conventional food safety?**

*Thomas Blaha*

It is essential to develop pre-harvest food safety programmes as an integral part of a consistent continuum of preventive measures from farm-to-table with the following levels of standardization, enforcement and supervision: voluntary industry standards; standards for vertical food supply chains with internal and external audits; governmental verification.

It is important to promote the development of vertical supply chains as enablers of substantial improvements through transparency, traceability and identity-preserved food production systems.

It is necessary to create on-farm food safety measures that are not detrimental for the economic survival of small farms and of the farming communities of developing countries.

**8. Pre-harvest food safety: Why? What to focus on? Interest of classical food processing industry in pre-harvest food safety**

*Mike van Schothorst*

The safety of processed food is to a large extent dependent on the quality and safety of the incoming raw materials. The Critical Control Points for many chemical hazards are at the primary agricultural level.

The microbiological concept of Food Safety Objectives (FSO) should be implemented worldwide in order to achieve the necessary safety requirements while maintaining the needed flexibility in pre-harvest control measures.

**9. Components/elements of pre-harvest food safety and their interplay in integrated quality assurance programmes: On-farm standardization, auditing and certification, use of the principles of Hazard Analysis Critical Control Points (HACCP) on the farm**

*Thomas Blaha*

The current bulk-commodity supply of agricultural primary products into the food production chain limits the possibility for substantial improvements in on-farm food safety, since there is hardly traceability. The current implementation of general, industry-wide on-farm quality and food safety standards are only effective if there are also instruments for enforcing them.

It is possible to combine the on-farm implementation of voluntary, market-driven HACCP-like and ISO-9000-compatible standards with third-party certification and governmental oversight of the food safety systems if the farms in question belong to transparent vertical supply chains that provide traceability back to the farms of origin.

**10. Components/elements of pre-harvest food safety and their interplay in integrated quality assurance programmes: Pre-harvest food safety surveillance and monitoring needs***Paul Teufel and Eckhard Weise*

Integrated monitoring and surveillance programmes should include human foodborne diseases, pathogens in food, water and in food animals.

Data should serve to identify human health hazards (prevalence and concentration) along the food chain, to initiate control measures and to prove their efficiency in all three areas of concern. There is a need for valid data as a basis for quantitative risk assessment.

**11. Components/elements of pre-harvest food safety and their interplay in integrated quality assurance programmes: Surveillance and monitoring needs at the regional and international level***Annemarie Käsbohrer*

Activities should be strengthened to provide standardized diagnostic methods and typing systems to differentiate zoonotic agents. Moreover, the implementation of harmonized sampling schemes at key points of the food chain, i.e. slaughterhouse, is indispensable to receive valid information.

An infrastructure has to be developed for data collection and their evaluation which includes all stakeholders. The distribution of the results should ensure close cooperation of all parties involved along the food chain.

**12. Components/elements of pre-harvest food safety and their interplay in integrated quality assurance programmes: Surveillance and monitoring needs at the regional and international level***Katrin Schmidt and M. Cristina Tirado*

Recommendations to improve the efficacy and efficiency of the actual regional and international surveillance systems of foodborne diseases include:

Promotion of intersectoral collaboration in the surveillance of foodborne diseases at the national and international levels

International support for infrastructure and training on surveillance in developing countries

Strengthening of cooperation between the WHO Surveillance Programme for Control of Foodborne Infections and Intoxication in Europe, the European Union and other international networks so as to avoid work duplication and to better achieve common objectives.

**13. Components/elements of pre-harvest food safety and their interplay in integrated quality assurance programmes: Product tracing back to the farm: needs and feasibility**

*Daniel Chaisemartin*

Identify animals at birth and retain identification until the animals are slaughtered.

Use tools which can guarantee the identification of the area in which the animals are kept, the identification of the animals and their movements and register this information.

Define the aims and select means appropriate to the structures and organizations of the country, set up procedures and regulations in order to reach these aims, define the obligations in the regulations and the sanctions if the principles of traceability are not respected.

**14. Implementing pre-harvest food safety - Challenges and solutions: Codex: Standard-setting in pre-harvest food safety**

*Thomas J. Billy*

The Codex strategic planning process and Chairman's Action Plan are critical in terms of ensuring that Codex remains relevant, efficient, and useful to all countries. Both a long-term vision and institutional changes in how Codex operates are needed.

A major strength of Codex is that its strategic objectives can focus on and address each segment of the farm-to-table chain. The marketplace is driving change along the entire farm-to-table chain including the pre-harvest area, and Codex must be ready for that change and play its international role.

For the future, Codex should focus on the appropriate application of risk analysis to the pre-harvest area. Risk communication will pose a unique challenge, particularly in developing countries, because an effective infrastructure is needed to enable pre-harvest food safety strategies to be developed, communicated to, and implemented by, producers.

**15. Implementing pre-harvest food safety - Challenges and solutions: OIE: Standard-setting in pre-harvest food safety**

*Bernard Vallat*

A seamless, collaborative interface between WHO, FAO, Codex and OIE in the field of veterinary public health, food and feed safety, including zoonoses, is necessary to avoid duplication and ensure a coherent and consistent approach in international standard setting.

New and robust data on foodborne pathogens, particularly in developing countries is needed so that the development and review of international standards appropriately addresses contemporary challenges in the area of food safety.

The involvement of veterinary administrations in the areas of pre-harvest food safety, particularly in the application of appropriate risk-based measures, should be strengthened.

**16. Implementing pre-harvest food safety - Challenges and solutions: FAO and pre-harvest food safety**

*Andrew W. Speedy*

Countries should review existing food safety and quality legislation so as to ensure that it provides an adequate basis for the control of feed-related hazards with the potential to cause public health risks.

The development of codes for food and feed safety should be relevant to and involve the full participation of developing countries and countries in transition. This reflects the mandates of the Codex Alimentarius Commission (CAC), OIE, FAO and WHO.

International organizations should continue to develop and make available information related to animal feed safety to their member countries thus supporting national feed control programmes.

**17. Implementing pre-harvest food safety - Challenges and solutions: Canada**

*M. Baker*

The design of food safety initiatives, whether pre-harvest or elsewhere, should:

- Be based on risk, taking into account hazards that exist in the enterprise, region and/or country in question
- Be outcome-oriented
- Incorporate performance measures to the extent possible; avoid prescriptivity and a one-size-fits-all approach.

Review and adapt inspection programmes to ensure that resources are directed to activities that will have the greatest impact on risk. For example, consider whether some of the resources that are currently devoted to post-mortem inspection could have a greater effect on food safety if applied elsewhere in the food continuum.

Recognize that food safety is a shared responsibility and adopt a collaborative approach to enlist the involvement and commitment of all segments of industry, consumer groups and others, in the development of food safety initiatives.

**18. Implementing pre-harvest food safety - Challenges and solutions: United States of America**

*Thomas J. Billy*

New requirements established for meat and poultry plants can have a ripple effect among producers. As plants are required to meet new requirements, they are in turn placing new food safety requirements on their suppliers.

The United States is using partnerships with states and commodity groups as a way of disseminating information on pre-harvest food safety to producers.

As we learn more about specific risk-reduction strategies for the production sector, quality assurance programmes containing HACCP-compatible practices pave the way for food safety improvements.

## **19. Implementing pre-harvest food safety: Australia**

*Luba Tomaska*

Pre-harvest food safety must be considered in the context of a farm-to-table food safety approach.

Any proposed risk management measures should be outcome-based and be based on sound risk assessment.

Food safety programmes, including pre-harvest food safety approaches, should involve a partnership between government, industry and consumers.

Meat producers need to consider themselves a part of the food safety business.

Pre-harvest food safety must start with Good Agricultural Practice.

## **20. Implementing pre-harvest food safety: France**

*Valerie Baduel*

Risk management policy should include clear and interactive communication between all stakeholders.

Progressive programme implementation is preferable.

Pre-harvest food safety requires a multidisciplinary and holistic approach.

The choice of food safety management should be based on risk assessment and the development of food safety objectives, recognizing that the process is in part politically driven.

Food safety measures should be sanitary outcome-based.

## **21. Implementing pre-harvest food safety: European Commission**

*Jean-Charles Cavitte*

Food safety should be considered in a consistent, dynamic and integrated farm-to-table approach.

Appropriate surveillance and monitoring of zoonotic agents along the food chain, in particular at primary production, and in the human population, are critical elements to support risk assessment and identify, prioritize and monitor risk management actions.

In addition to specific control actions, good farming practices are critical for reducing the prevalence of a number of zoonotic agents further down the food chain.

## **22. Implementing pre-harvest food safety: Germany**

*Dieter Protz*

Establishment of central institutions for both risk assessment (diagnosis, epidemiology) and risk management (control of zoonoses) taking account of resistance to antibiotics at both levels.

These institutions would be responsible for:

- The development of sampling plans
- The implementation of monitoring programmes
- Development of control programmes for zoonoses and resistance to antibiotics.

Creation of a regulatory system which allows implementation of base programmes, in particular for the control of emerging zoonoses, and resistance to antibiotics at the pre-harvest level.

Development of a government supervised system through which the present anonymous production of agricultural produce would be replaced by a controllable and transparent pre-harvest scheme, based on mechanisms of internal audits, which would allow the traceability of each product and its components to every level of primary production.

### **23. Implementing pre-harvest food safety: India**

*S. V. Vaidya*

There should be contract farming or integrated approach.

There should be good incentives to farmers for delivering safe animals to the abattoir.

High level of sanitary and phytosanitary measures should be properly prescribed to abattoirs.

### **24. Implementing pre-harvest food safety: Namibia**

*Herbert P. Schneider*

Active veterinary involvement - including private practitioners - at all levels of pre-harvest food safety.

Involvement of professional organizations (NGOs) e.g. World Veterinary Association at international decision/guideline/regulation-making level.

Holistic - full involvement - of all stakeholders (including producer, veterinarian) in a pre-harvest food safety programme (including training and education).

### **25. Implementing pre-harvest food safety: Denmark**

*Flemming Bager*

Where possible, the implementation and running of control programmes must be in close co-operation between authorities and industry and should make use of industry infrastructure for collection of samples and implementation of control measures.

Control programmes should be designed in close collaboration with epidemiologists and microbiologists to ensure that they are efficiently designed and that they are fine-tuned as required.

There should be close collaboration between medical and veterinary epidemiologists and microbiologists to monitor progress in terms of effect on the human incidence of disease.

**26. Implementing pre-harvest food safety: Ireland**

*Nial Kavanagh*

Pre-harvest food safety programmes should focus on:

Quality Assurance scheme for table eggs which controls *Salmonella enteritidis*;

*Salmonella* control programme for pigs;

Strategy for the control of *E. coli* 0157.

**27. Pre-harvest food safety: Challenges and opportunities: Relevance of pre-harvest programmes in countries with extensive animal husbandry**

*C.M. Veary*

Developing countries must consider improved human and animal health surveillance and investigation systems in order to quantify risk data for foodborne diseases.

The environment should be given attention in the development and implementation of pre-harvest food safety programmes.

**28. Pre-harvest food safety: Challenges and opportunities: Special aspects of ecological farm management**

*Gerold Rahmann*

The standards of organic agriculture are able to produce, process and prepare healthy and safe food despite the fact that they are a process and not a product claim.

The safety of organic food (prevention of diseases and contamination) needs to be monitored like conventionally produced, processed and prepared food. The consideration of product qualities like safety into the standards, certification process and labelling as “organic food“ is necessary.

The direct and indirect as well as short and long-term aspects have to be part of the definition of “safe food“. Food safety and the healthy issues of organic and conventional food need further research and new methods of analysis.

**29. Pre-harvest food safety: Challenges and opportunities for agriculture**

*Michel Siméon*

There is a need to quantify the importance and impact of food safety issues with regard to:

- The cost of limitations to access to external markets
- The cost of the absence of quality
- The importance and priority of food safety with regard to public health
- The need to go beyond risk assessment, to assess relative importance as compared to other issues

- The impact of Sanitary and Phytosanitary Agreement (SPS) on the rural poor
- Developing countries need to analyse their institutional set up and capacity, in particular:
- Clarify role of actors: public and private sector roles in export trade, role of government, consumers and civil society in domestic issues
  - Identify the needs that could be better addressed through regional cooperation
  - Identify needs for research, surveillance systems, observatories, epidemiological monitoring, and capacity building in risk assessment.

Developing countries need to identify and implement policies to enhance sustainable income opportunities for resource-poor livestock keepers and to mitigate potential negative impacts on the poor of animal health and food safety related measures.

### **30. Pre-harvest food safety: Challenges and opportunities for veterinary medicine**

*Jim Edwards*

Systems to ensure safe food should be risk based so that the measures enforced are justified by the actual risks involved. Veterinarians should be involved throughout the continuum of the food chain.

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**Dr Subhash Vaidya**, Chair Compound Livestock Feed Manufacturers Association, 42 Shaniwarpath, Pune 411030 (MS), India.

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**Dr Michiel van Schothorst**, Secretary, International Commission on Microbiological Specifications for Food, Vevey, Switzerland.

**Prof Courtney Martin Veary**, Department of Animal and Community Health, Faculty of Veterinary Medicine, Private Box X04, Onderstepoort, 0110, Republic of South Africa.

**Dr Henrik Wegener**, Head, The Danish Zoonosis Centre, Bülowsvej 27, 1790 Copenhagen V, Denmark.

**Dr Tadeusz Wijaska**, Mission of the Republic of Poland to the European Union, 282-284, av. De Treveuren, Brussels, Belgium.

### **Food and Agriculture Organization of the United Nations**

**Dr Daniela Battaglia**, FAO, Animal Production and Health Division, Viale delle Terme di Caracalla, 00100 Rome, Italy.

**Dr Samuel Jutzi**, Director, FAO, Animal Production and Health Division, Viale delle Terme di Caracalla, 00100 Rome, Italy.

**Dr Andrew Speedy**, Senior Officer, FAO, Animal Production and Health Division, Viale delle Terme di Caracalla, 00100 Rome, Italy.

### ***Office International des Epizooties***

**Mr Alex Thiermann**, President of the International Animal Health Code Commission of the OIE, Office International des Epizooties, 12, rue de Prony, 75017, Paris, France.

**Dr Bernard Vallat**, Director General OIE, Office International des Epizooties, 12, rue de Prony, 75017, Paris, France.

### **Other International Organizations**

**Dr Robin Bywater**, Confédération Mondiale de l'industrie de la santé animale (COMISA), Rue Defacqz 1, 1000 Brussels, Belgium.

**Dr Michel Siméon**, The World Bank, 1818 H Street N.W., Washington, USA.

**Dr Luba Tomaska**, Australian New Zealand Food Authority (ANZFA), 55 Blackall Street, Barton ACT 2600, 7186 Canberra MC ACT 2610, Australia.

### **Local Organizers**

**Dr Luepo Ellerbroek**, Federal Institute for Health Protection of Consumers and Veterinary Medicine (BgVV), Diedersdorfer Weg 1, 12277 Berlin, Germany

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#### **WHO Secretariat**

**Dr Peter Braam**, World Health Organization, Communicable Diseases Surveillance and Response, CH – 1211 Geneva 27, Switzerland.

**Dr Alan Hogue**, World Health Organization, Sustainable Development and Healthy Environments, CH – 1211 Geneva 27, Switzerland.

**Dr Gerald Moy**, Sustainable Development and Healthy Environments, CH – 1211 Geneva 27, Switzerland.

**Dr Klaus Stöhr**, World Health Organization, Communicable Diseases Surveillance and Response. CH – 1211 Geneva 27, Switzerland.

**Annex 3: Agenda**

<b>Time</b>	<b>Monday, 26 March 2001</b>	<b>Speaker</b>
08.30 – 09.30 hrs	Registration, Welcome Coffee	
09.30 – 11.00 hrs	<ul style="list-style-type: none"> <li>• Welcome</li> <li>• Introduction, Objectives, Scope</li> <li>• Food animal production</li> <li>• Foodborne infections</li> </ul>	BgVV, MOH, MOCPPFA WHO, FAO, OIE Dr S. Jutzi Dr K. Stöhr
11.00 – 11.30 hrs	Coffee break	
11.30 – 13.00 hrs	<p><b>Experiences with dedicated pre-harvest food safety programmes</b></p> <ul style="list-style-type: none"> <li>• <i>Salmonella</i></li> <li>• <i>Campylobacter</i></li> <li>• BSE</li> </ul>	Dr H. Wegener Dr E. Berndtson Dr D. Matthews
13.00 - 14.00 hrs	Lunch Break	
14.00 - 15.30 hrs	<p><b>Experiences with dedicated pre-harvest food safety programmes</b></p> <ul style="list-style-type: none"> <li>• Zoonotic enteropathogenic <i>E. coli</i></li> <li>• <i>Trichinella</i></li> <li>• Development of prudent use of antimicrobials</li> </ul>	Dr P. Desmarchelier Professor C. Kapel Dr A. van den Bogaard
15.30 - 16.00 hrs	Tea/Coffee	
16.00 - 18.00 hrs	<p><b>Pre-harvest food safety Why? What to focus on ?</b></p> <ul style="list-style-type: none"> <li>• What makes it belong to and distinct from conventional food safety</li> <li>• Interest of classical food processing industry in pre-harvest food safety</li> </ul> <p><b>Components/elements of pre-harvest food safety and their interplay in integrated quality assurance programmes</b></p> <ul style="list-style-type: none"> <li>• On-farm standardization, auditing and certification, use of HACCP principles on the farm</li> <li>• Pre-harvest food safety surveillance and monitoring needs (incl. slaughterhouse monitoring)</li> </ul>	Professor T. Blaha  Dr M. van Schothorst  Professpr T. Blaha  Dr P. Teufel & Dr E. Weise
	Informal get-together in the foyer of the BgVV	

Time	Tuesday, 27 March 2001	Speaker
09.00 – 10.30 hrs	<p><b>Components/elements of pre-harvest food safety and their interplay in integrated quality assurance programmes (cont'd.)</b></p> <ul style="list-style-type: none"> <li>• Surveillance and monitoring needs at the regional and international level: current situation and potential future developments</li> <li>• Product tracing back to the farm: needs and feasibility</li> </ul> <p><b>Implementing pre-harvest food safety - Challenges and solutions</b></p> <ul style="list-style-type: none"> <li>• Codex: standard setting in pre-harvest food safety</li> </ul>	<p>Dr A. Kaesbohrer &amp; Dr K. Schmidt</p> <p>Dr D. Chaisemartin</p> <p>Mr T. Billy</p>
10.30 – 11.00 hrs	Tea/ Coffee break	
11.00 – 12.30 hrs	<p><b>Implementing pre-harvest food safety - Challenges and solutions</b></p> <ul style="list-style-type: none"> <li>• Melbourne Conference in International Food Trade</li> <li>• OIE and pre-harvest food safety</li> <li>• FAO and pre-harvest food safety</li> </ul>	<p>Dr B. Vallat</p> <p>Dr A. Speedy</p>
12.30 – 13.30 hrs	Lunch break	
13.30 – 15.30 hrs	<p><b>Implementing pre-harvest food safety</b></p> <ul style="list-style-type: none"> <li>• Canada</li> <li>• USA</li> <li>• Australia / New Zealand</li> <li>• EC</li> </ul>	<p>Dr M. Baker</p> <p>Mr T. Billy</p> <p>Dr L. Tomaska</p> <p>Dr J.-C. Cavitte</p>
15.30 – 16.00 hrs	Coffee break	
16.00 – 18.00 hrs	<p><b>Implementing pre-harvest food safety</b></p> <ul style="list-style-type: none"> <li>• France</li> <li>• Germany</li> <li>• India</li> <li>• Namibia</li> </ul>	<p>Dr V. Baduel</p> <p>Dr D. Protz</p> <p>Dr S V. Vaidya</p> <p>Dr H. Schneider</p>

<b>Time</b>	<b>Wednesday, 28 March 2001</b>	<b>Speaker</b>
09.00 – 10.30 hrs	<p><b>Implementing pre-harvest food safety (cont'd.)</b></p> <ul style="list-style-type: none"> <li>• Denmark</li> <li>• UK</li> <li>• Ireland</li> </ul> <p><b>Pre-harvest food safety: Challenges and opportunities</b></p> <ul style="list-style-type: none"> <li>• Relevance of pre-harvest programmes in countries with extensive animal husbandry</li> </ul>	<p>Dr F. Bager Dr P. Gayford Mr P. O'Mahony</p> <p>Dr C. M. Veary</p>
10.30 – 11.00 hrs	Tea/ Coffee break	
11.00 – 13.00 hrs	<p><b>Pre-harvest food safety: Challenges and opportunities</b></p> <ul style="list-style-type: none"> <li>• Special aspects of ecological farm management</li> <li>• For consumers</li> <li>• For agriculture</li> <li>• For veterinary medicine</li> </ul>	<p>Dr G. Rahmann</p> <p>Consumers International Dr M. Simeon Dr J. Edwards</p>
13.00 – 14.00 hrs	Lunch break	
14.00 – 15.00 hrs	<b>Conclusions and Recommendations</b>	
15.00 – 15.15 hrs	<b>Closure</b>	<b>(WHO/BgVV)</b>