Emerging Food Safety Risks: New Developments

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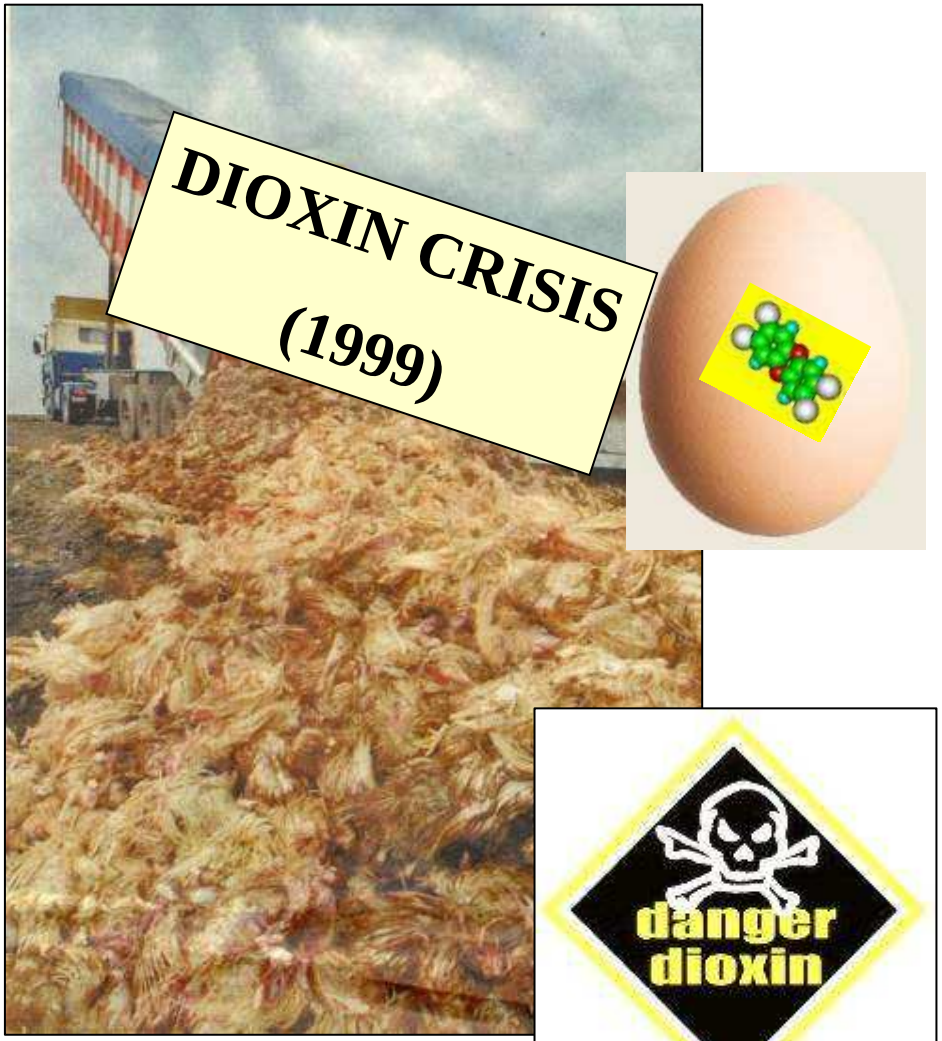
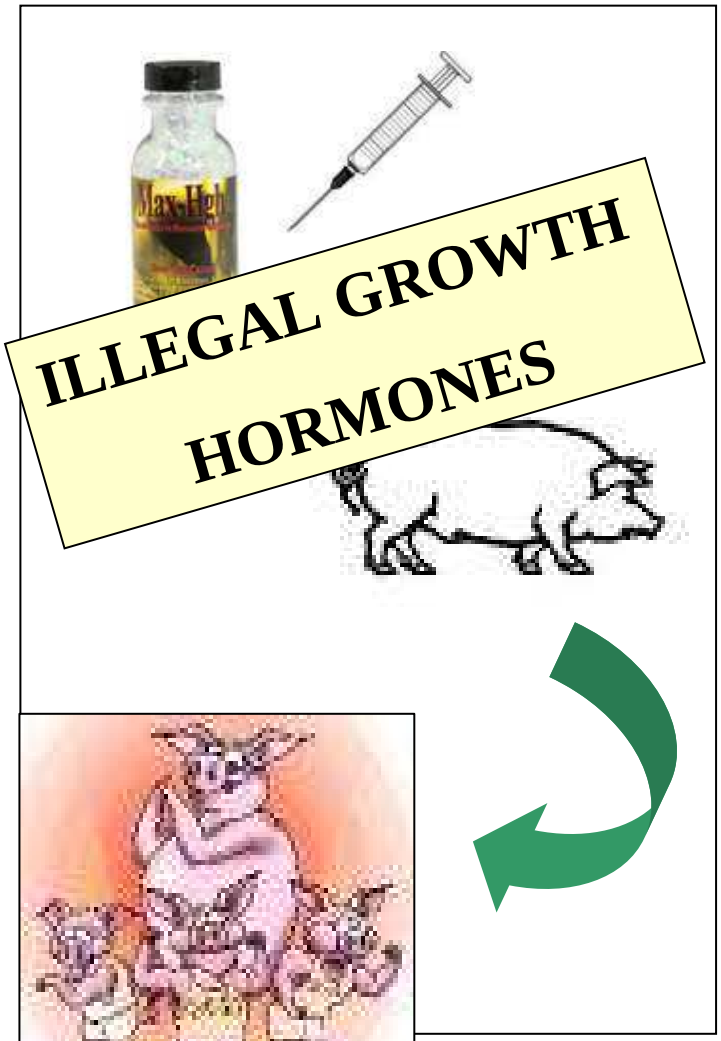
Outline of the presentation

- Food safety crises in Europe
- Food Safety Authorities (EU, The Netherlands)
- Emerging risk definitions
- Emerging risk identification: a holistic approach





Safe Foods

The Pusztai Potato

Illustration: Ll

Frankenstein Food

Introduction of GMO's in the European food chain

GMO-free Europe

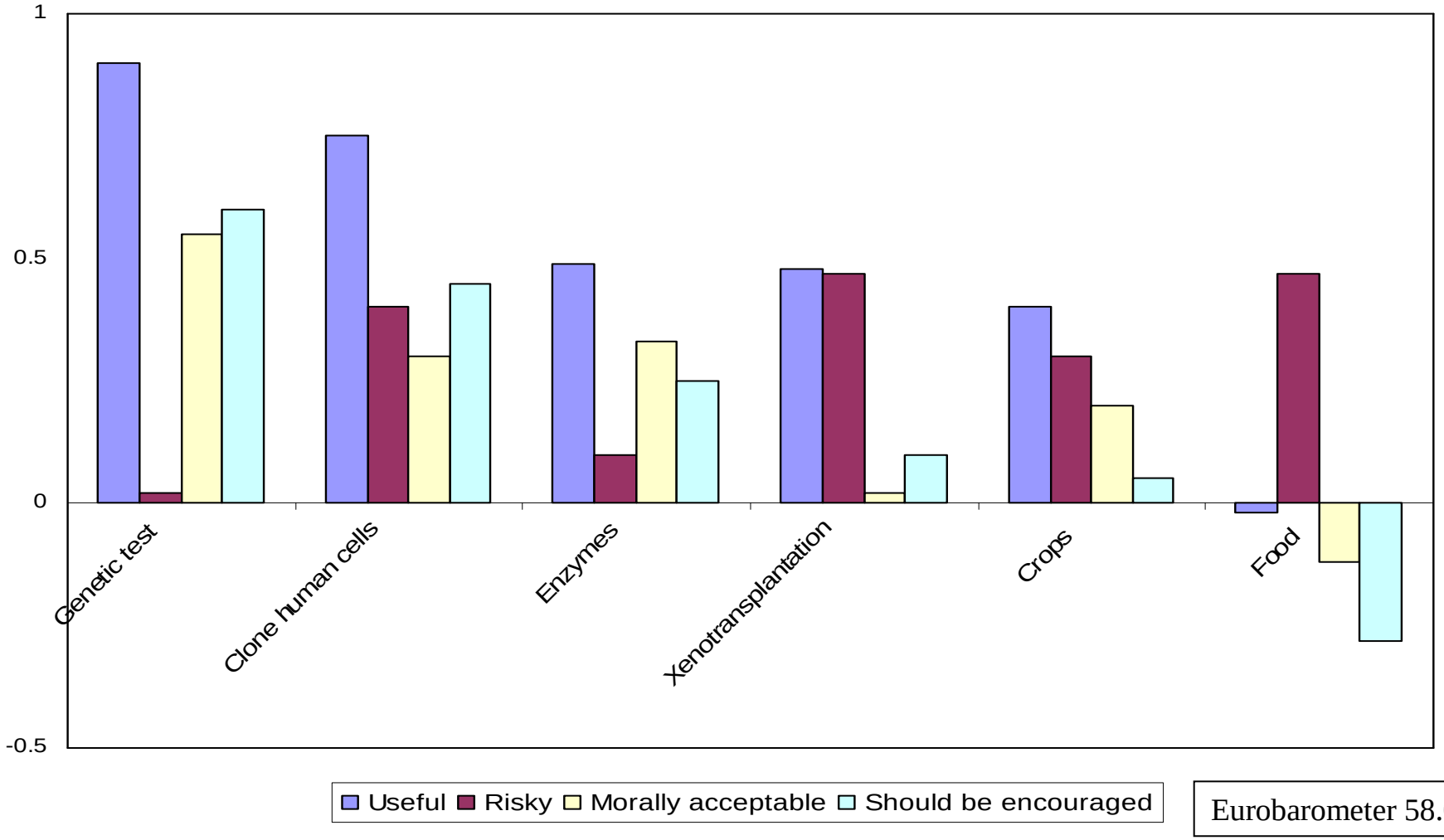
Biohazard

Friends of the Earth

Greenpeace

safe Foods

European attitudes to six applications of biotechnology in 2002



Eurobarometer 58.0

Food Safety & Risk Assessment

- Broad public concern about the safety of the European food supply
- BSE, dioxin, *E. coli* 0157, GM food crops…
- Low public trust in how food crises were handled
- Low trust in the regulatory system in Europe

Safe Foods

The European Commission reacted

- EU White Paper on Food Safety (COM (1999), 719 final)

- General Food Law (Regulation 178/2002)

- Establishment of the European Food Safety Authority (EFSA) in 2002, http://www.efsa.eu.int


E F S A | European Food Safety Authority - Microsoft Internet Explorer
Bestand Bewerken Beeld Favorieten Extra Help
Vorige Zoeken Favorieten
Adres http://www.efsa.eu.int/about_efsa/catindex_en.html
Ga naar Links
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Moving towards full strength
Last updated: 14 April 2005
Following a series of food scares in the 1990s (eg BSE, dioxins...) which undermined consumer confidence in the safety of the food chain, the European Union concluded that it needed to establish a new scientific body charged with providing independent and objective advice on food safety issues associated with the food chain. Its primary objective as set out in the White Paper on Food Safety would be to: "...contribute to a high level of consumer health protection in the area of food safety, through which consumer confidence can be restored and maintained." The result was the European Food Safety Authority (EFSA).
Palazzo Ducale in Parma, Italy
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Tasks of EFSA

- Risk assessment

- Risk communication

- *NOT* Risk management!

In many EU members states Food Safety Authorities were established; also in The Netherlands

Ministry of Agriculture, Nature and Food Quality (LNV)
(Ministry of Health, Welfare and Sport)

Food and Consumer Product Safety Authority (VWA)

KvW
Inspectorate for Health Protection and Veterinary Public Health

RVV
National Inspection Service for Livestock and Meat

Food Authorities reaction

"To decrease the number of food safety crises it is important to detect the problem in an very early stage, preferably before it develops"

Available tools:

- Monitoring systems
- Rapid Alerts:
  - EU: RASFF
  - WHO: INFOSAN

Overview of early warning systems

- **Overview of early warning systems (reactive)**
  - European Rapid Alert System on Food and Feed (RASFF)
  - European Centre for Disease Prevention and Control (ECDC)
  - Center for Disease control (CDC, USA)
  - WHO early warning activities
    - Global Public Health Intelligence Network (GPHIN)
  - …

Source: SAFE FOODS; to be published

Overview of early warning systems

- **Predictive early warning: emerging risk systems**
  - Early warning systems for mycotoxin in maize and / or wheat
  - Trend analysis using information of early warning systems (e.g. RASFF)
  - Holistic approach

Source: SAFE FOODS; to be published

Emerging Risk Projects

Some projects aim to develop new tools for the early detection of emerging risks (with involvement of RIKILT)

- EU 6th FP: PERIAPT
- EU 6th FP: SAFE FOODS; Workpackage 2
- EFSA: EMRISK
- Dutch project: Emerging Risks in the Dutch Food Chain

Holistic approach: look at influences inside *and* outside the food chain

Some definitions

Emerging Risk:

A potential food or feed borne or diet-related hazard that may become a risk for human health in the (near) future.

Emerging Risks can result from three different types of hazards such as:

- Type 1: Unidentified new form of hazard (e.g. Avian influenza)
- Type 2: Not well-known, unclear, hazard (e.g. acrylamide, BSE, endocrine disrupter)
- Type 3: Well known re-emerging hazard: (e.g. *Brucellosis*)

Excluded are:

- The well-characterised hazards that are presently controlled

Emerging Risk identification:

A system or procedure aimed at <u>proactively</u> identifying and preventing a potential hazard from becoming a risk.

Characteristics:

- Anticipatory systems instead of responsive systems (e.g. increase or decrease of an indicator (see host environment analysis)
- Different from rapid alert systems (e.g. RASFF)
- Preventive measure

The system/procedure and/or network has three components, each fulfilling different tasks:

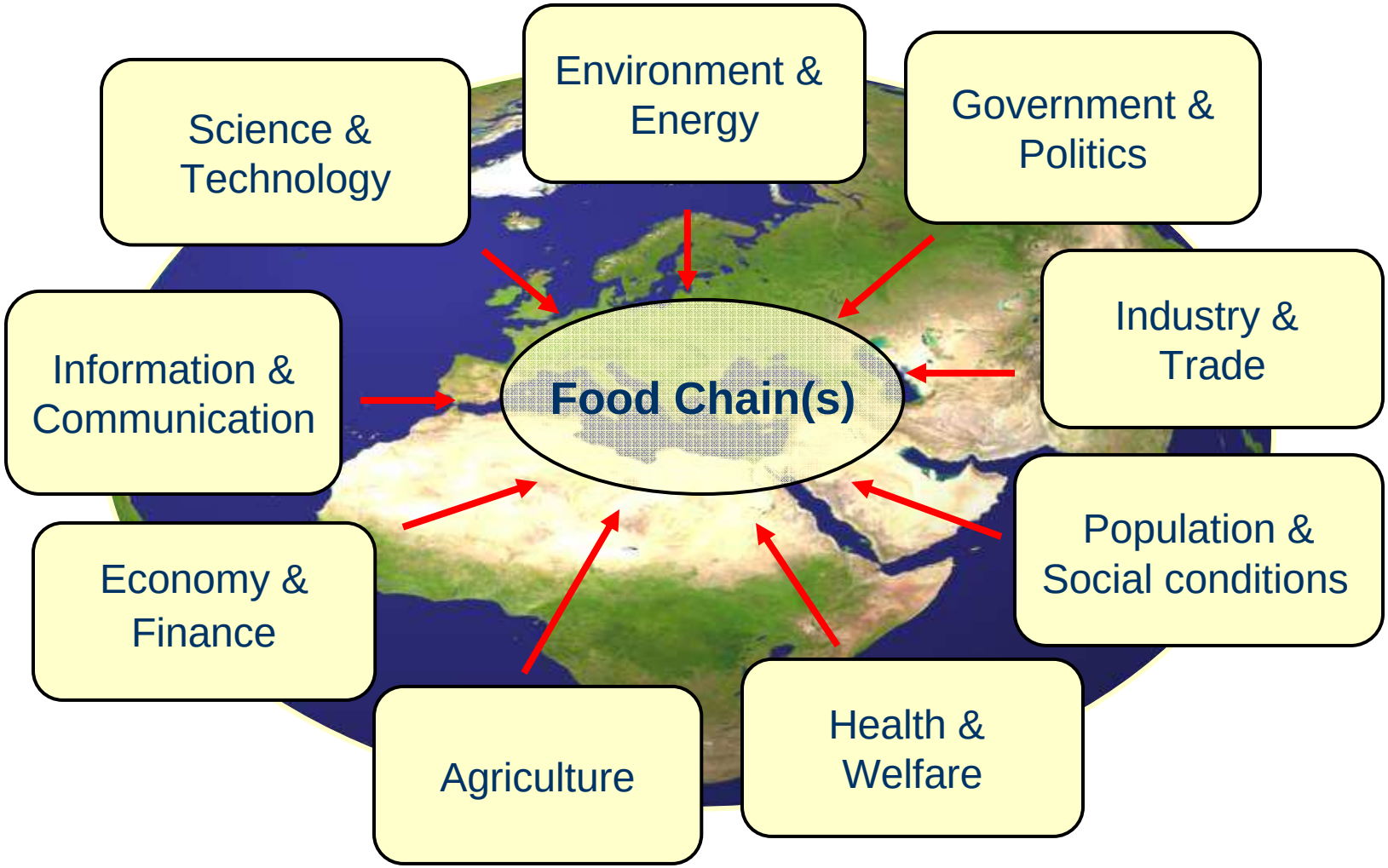
- Exploration of new/changing risk fields (type 1)
- Characterisation and assessment of unclear risks (type 2)
- Determination of situational changes in known risks (type 3)

Holistic approach

Indicator

A (provisionally) signal that indicates (directly or indirectly) the (possibility of) occurrence of a type 1, 2 or 3 emerging risk

Examples of Influential Sectors



Source: Wim Ooms VWA, 2006

Questions to identify what key information was or would have been of vital importance

- Were there any indicators that could have predicted the emerging risks at stake and, how can the emerging risks be identified in the future?
- Did the observed risks correspond to a previous assessment?
- What did we fear, and what did we know?
- Were there crosscutting sectoral warning signals received?
- What information was needed to spot the problem?
- Were there any unexpected aspects of vulnerability?
- Which trends contributed to creating the evolution of the risk or systemic vulnerability?what was the impact of the problem on the public?
- What role(s) did the stakeholders play?
- What actions undertook industry and risk management to mitigate the problem?

Key information

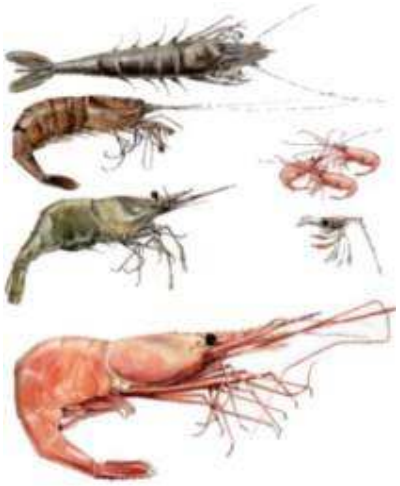
To determine the indicators (first influential sector) for emerging food safety risks, case studies have been performed on recent food safety crises.

Examples (from different projects):

- Use of botanicals/ herbs in Food and Feed
  - Renal disease after Chinese slimming pills in Belgium
  - Intoxication by consumption of star anise tea
- BSE
- Antibiotics in cultured shrimp
- Acrylamide
- Perfluorinated contaminants in fish
- PCB's/ dioxines and organochloor pesticides in fish
- Dioxine in pork meat
- VTEC Escherichia coli
- ...

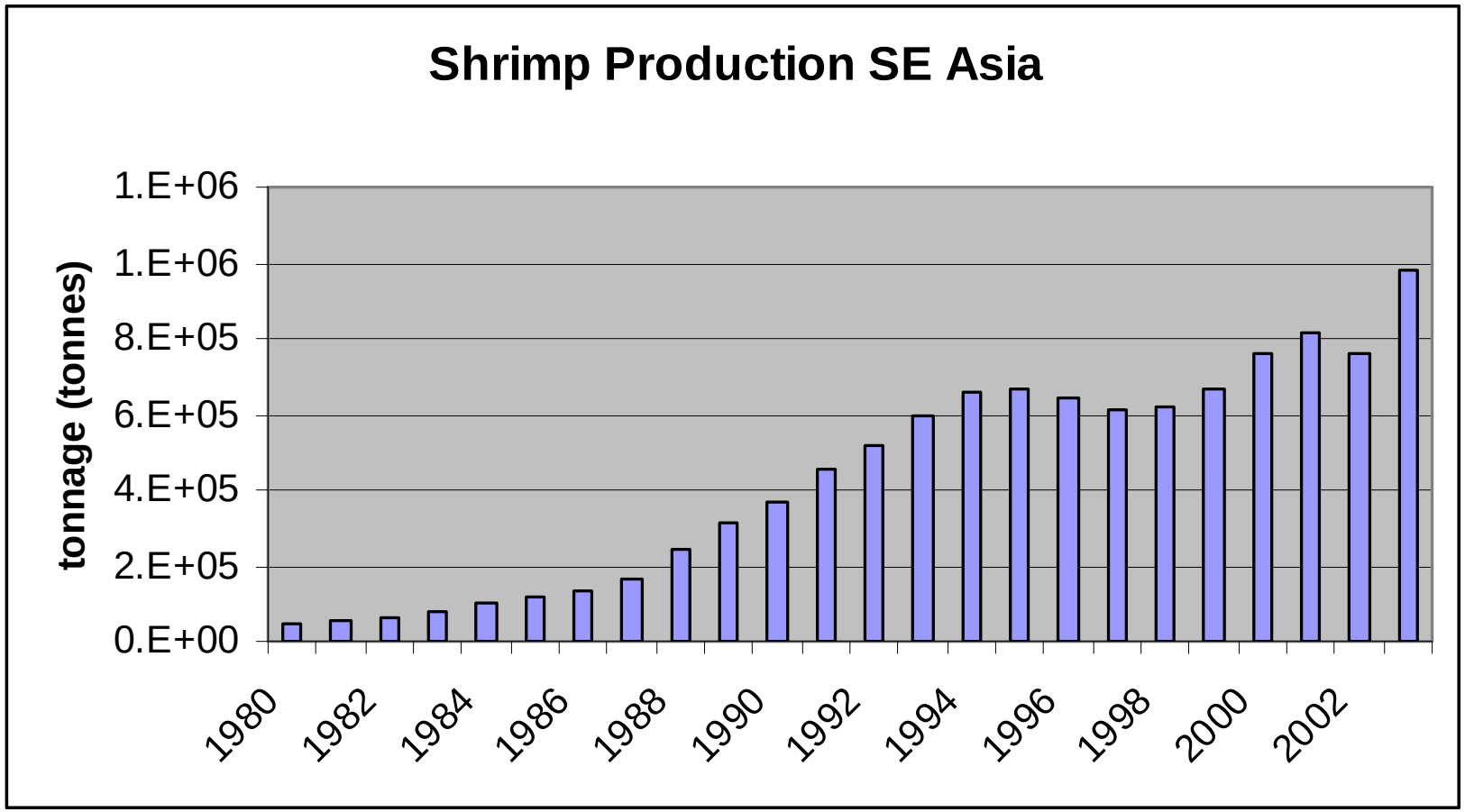
A case study

- Antibiotics in cultured shrimp (an example)



Source: "Inventory of possible emerging hazards to food safety and an analysis of critical factors" (to be published 2006) by G.A Kleter, M. Poelman, M.J. Groot and H.J.P. Marvin

Increased demand in Europe for fishery products; increased production in SE Asia

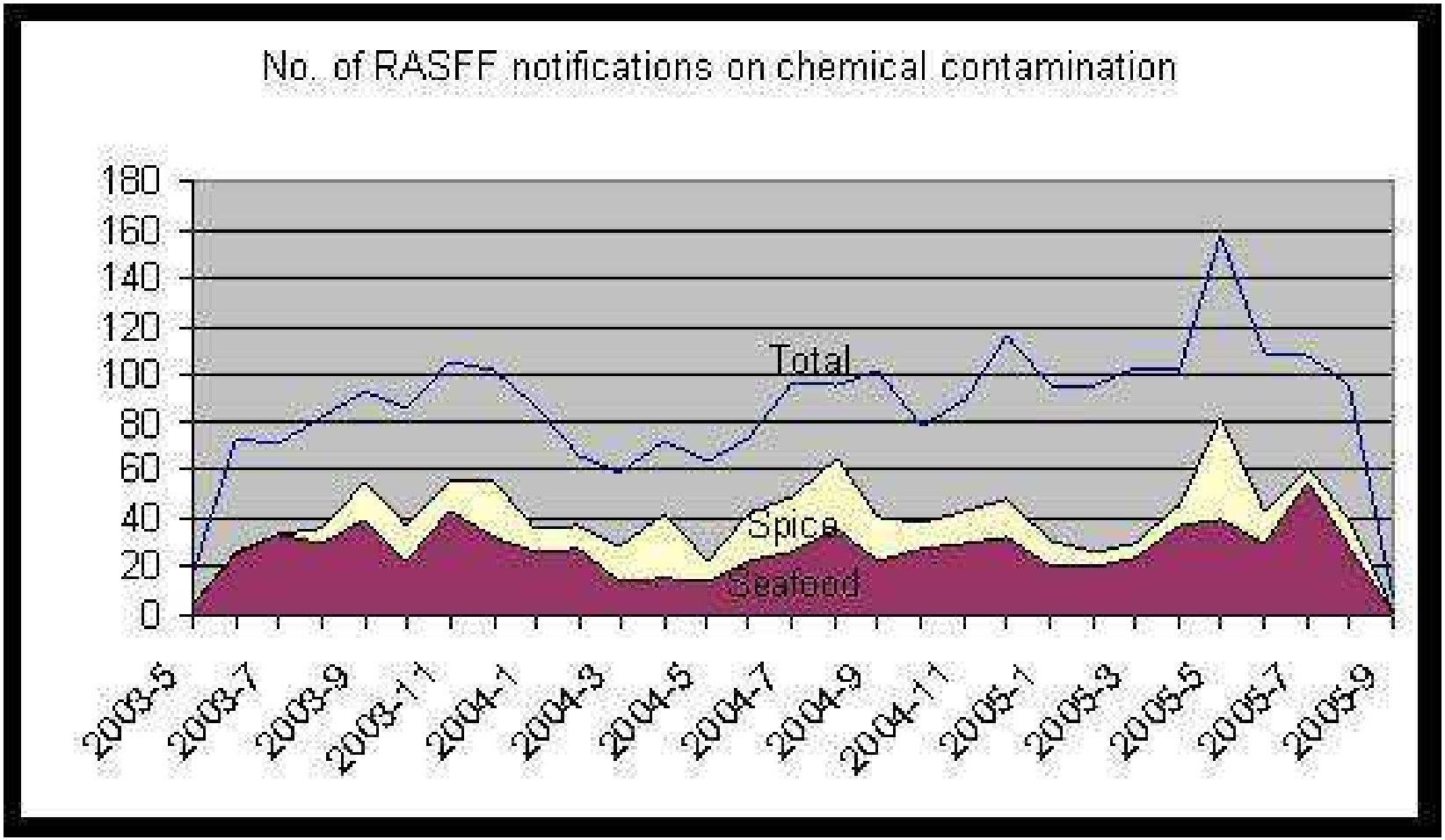


Problems occurring

Increased production associated with intensification of aquaculture

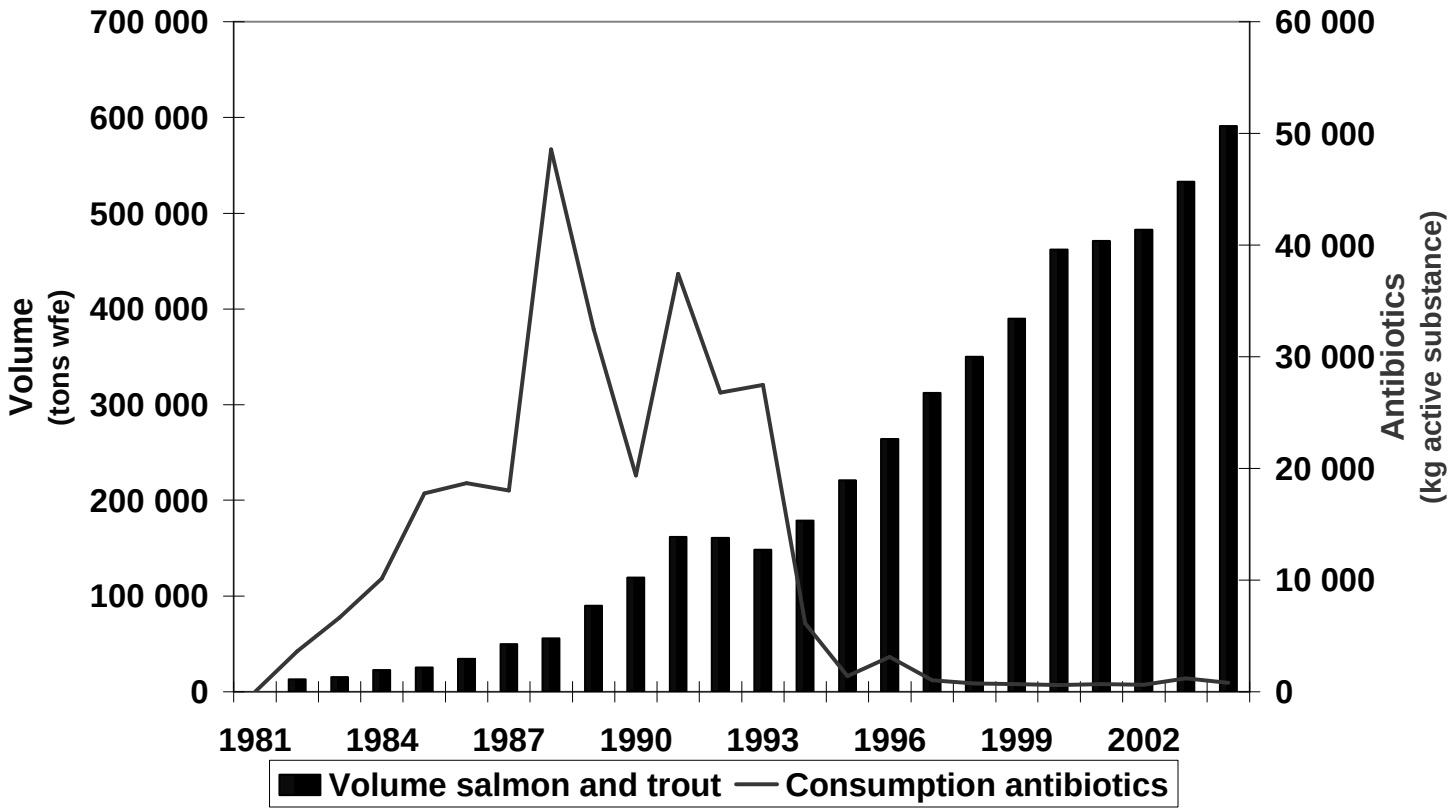
- Increase disease pressure
- Increase use of antibiotics (CAP and nitrofuran)
- No MRL existed for these compounds
- EU; zero tolerance
- Increased control

Monthly notifications of chemical contamination in RASFF



Source: Consumer health hazards in international food trade; Thom Achterbosch 2005

Another case: Use of antibiotics in Norway set off against the volume of farmed salmon and trout



Source: van der Roest et al. 2007

Example of holistic analysis

- Increased production → increased disease pressure → antibiotic use → risk. Indicator: increased production. Source: FAO, EUROSTAT
- Increased small scale production → lack of knowledge → misuse → risk. Indicator: increased small scale production; Source: FAO
- More resistant strains → other antibiotics → new risk. Indicator: more resistant strains; Source: science programs
- Lack of international harmonised legislation → zero tolerance → risk.

Emerging risk systems: Holistic approach

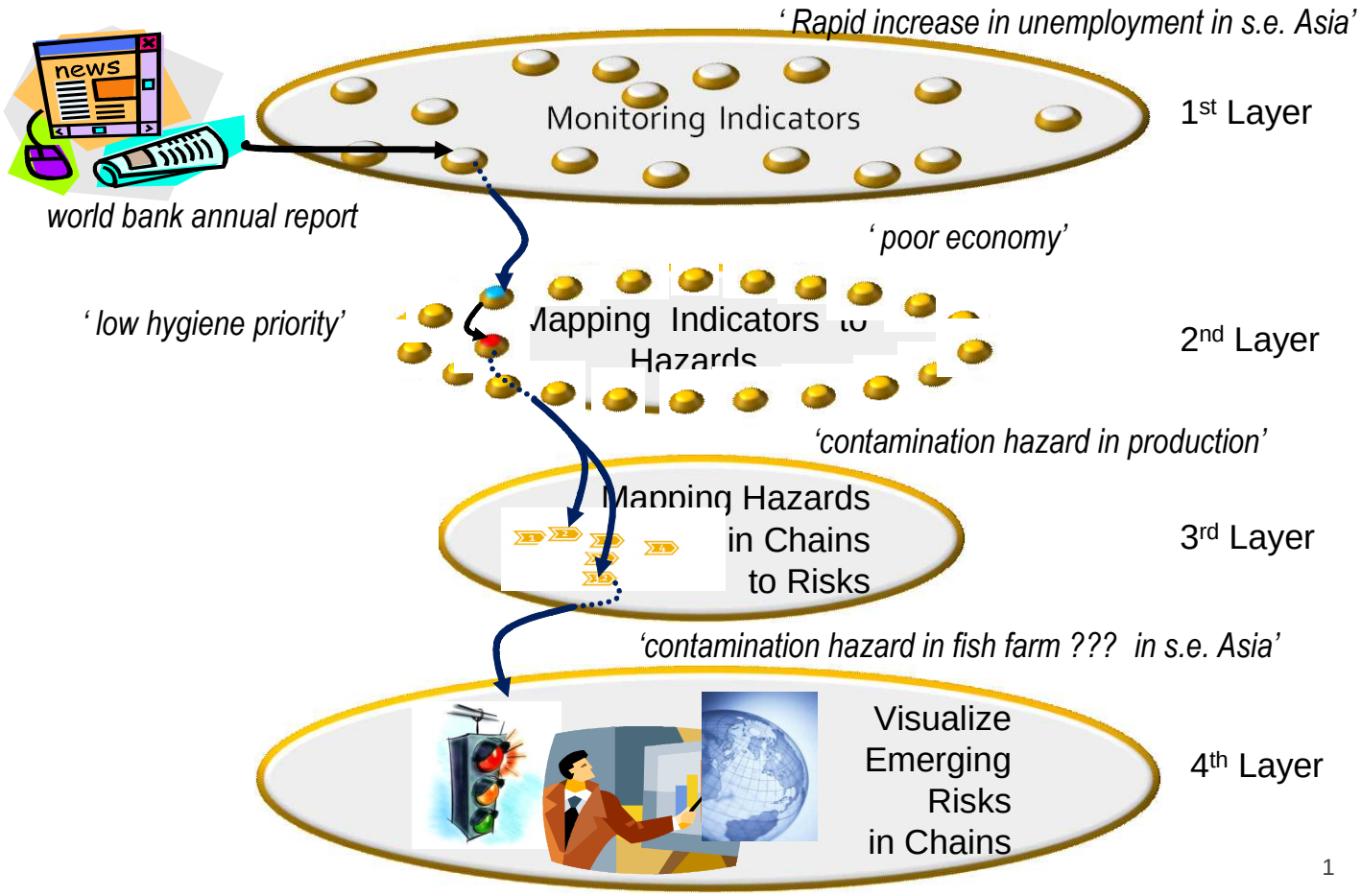
Conclusions of the case studies

In every case study influential sectors were identified

- Most frequent influential sectors were:
  - Science and technology
  - Human behavior
  - Nature and environment
  - Legislation & economy
- Many indicators were identified, generic and case-specific
- Emerging risk systems based on holistic principle seem promising but need much more research

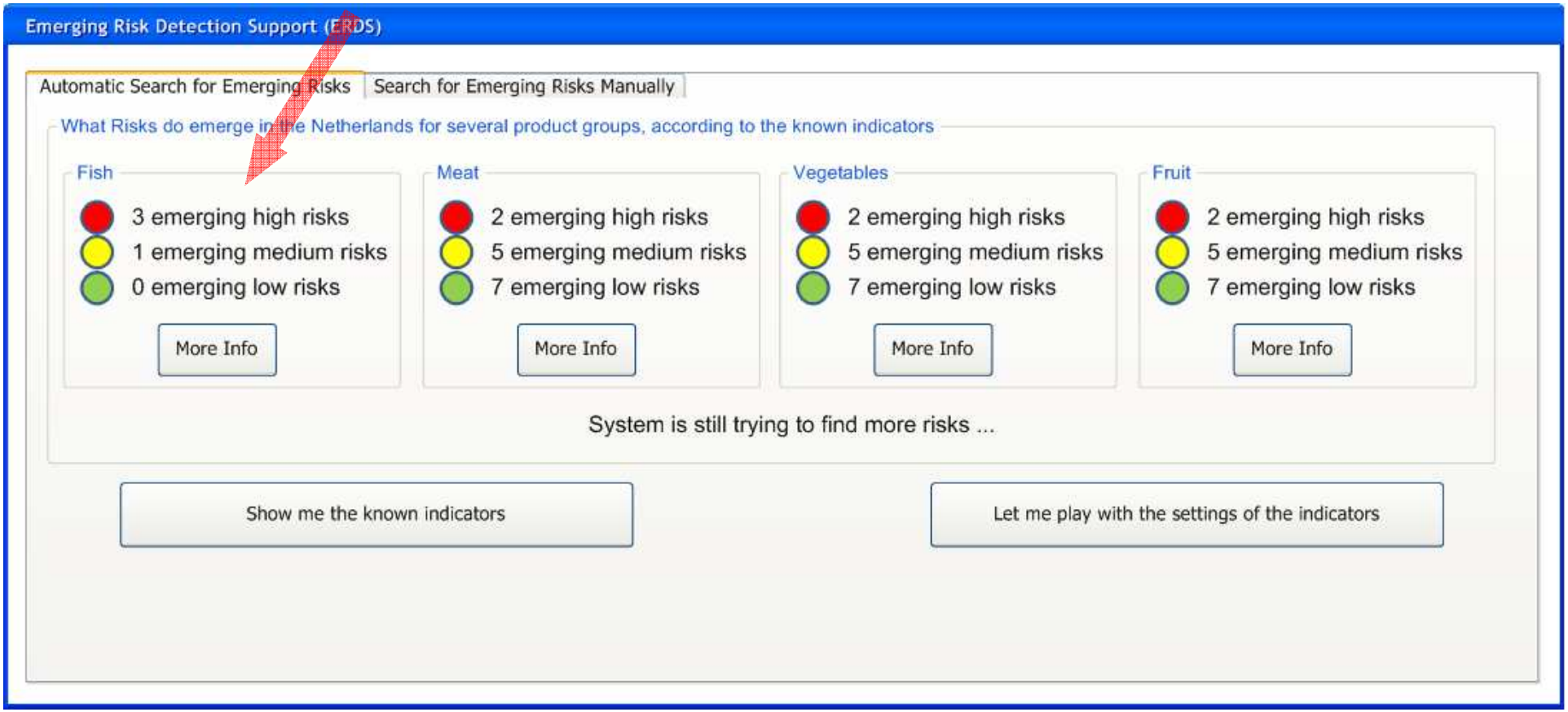
Proposed 4-layer system for Emerging Risk Detection

Predicting Emerging Risks



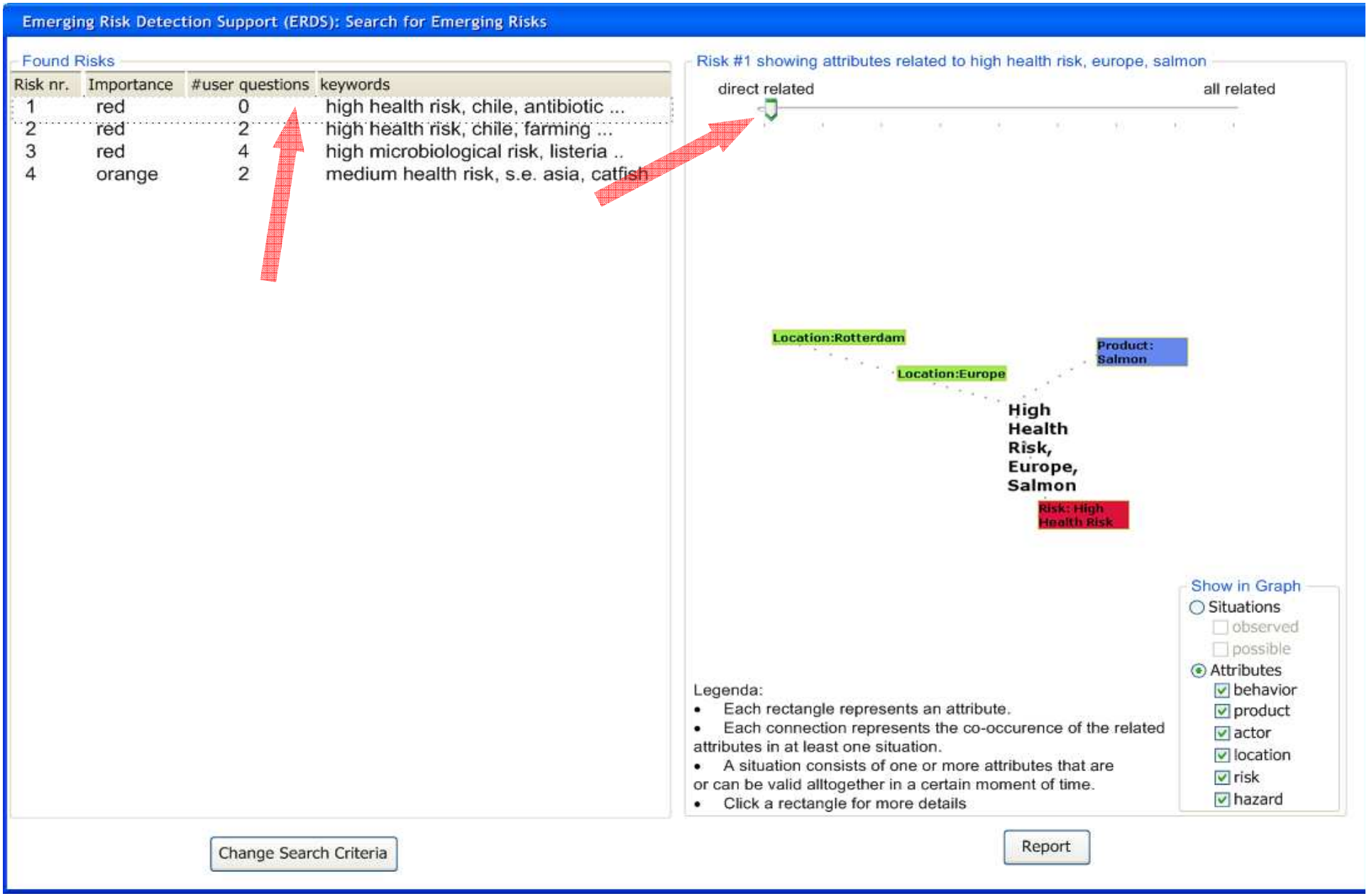
Source: Hulzebos et al. 2007

Possible design of the Emerging Risk Detection System; first page



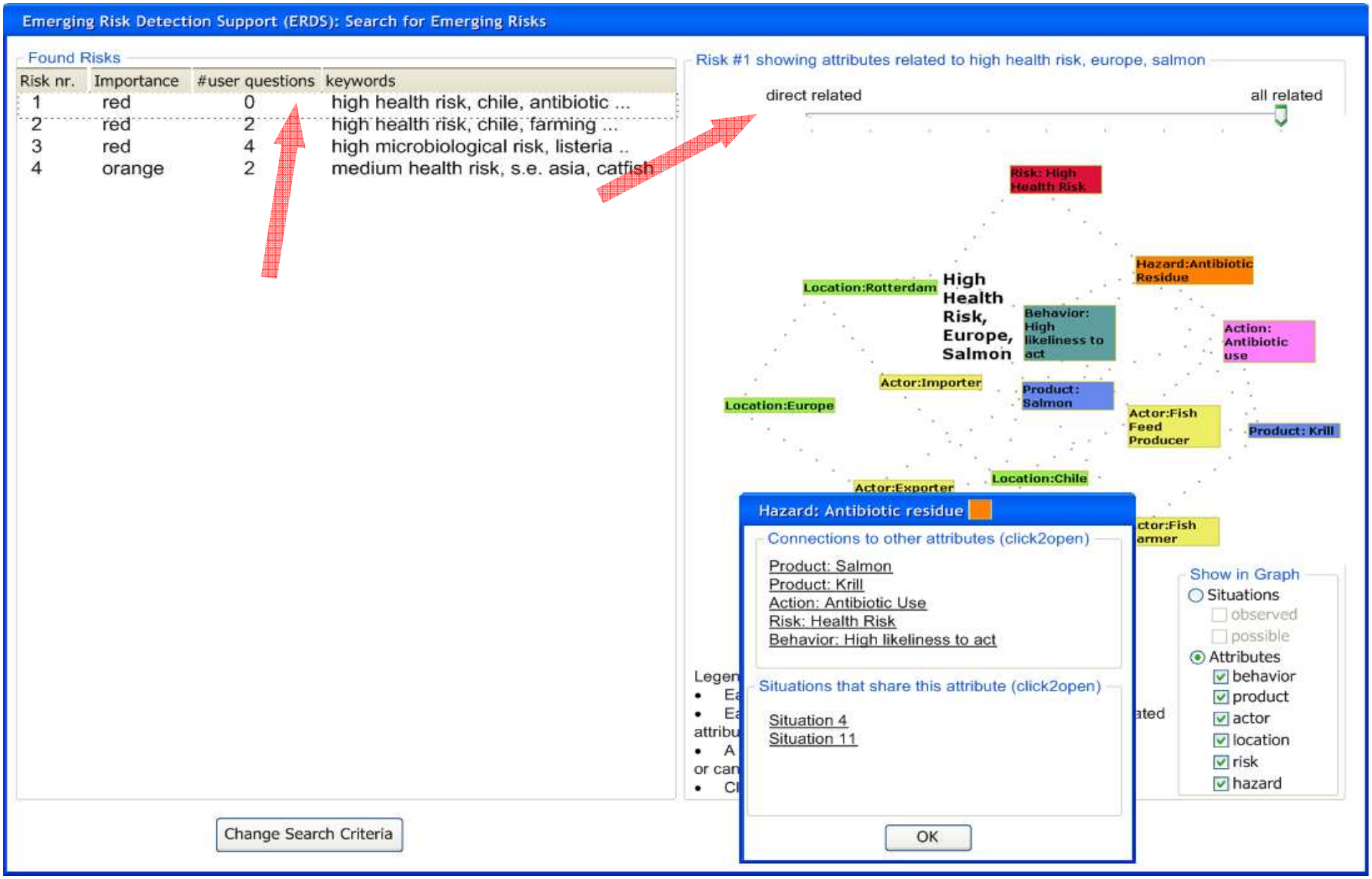
Source: Hulzebos et al. 2007

start from system

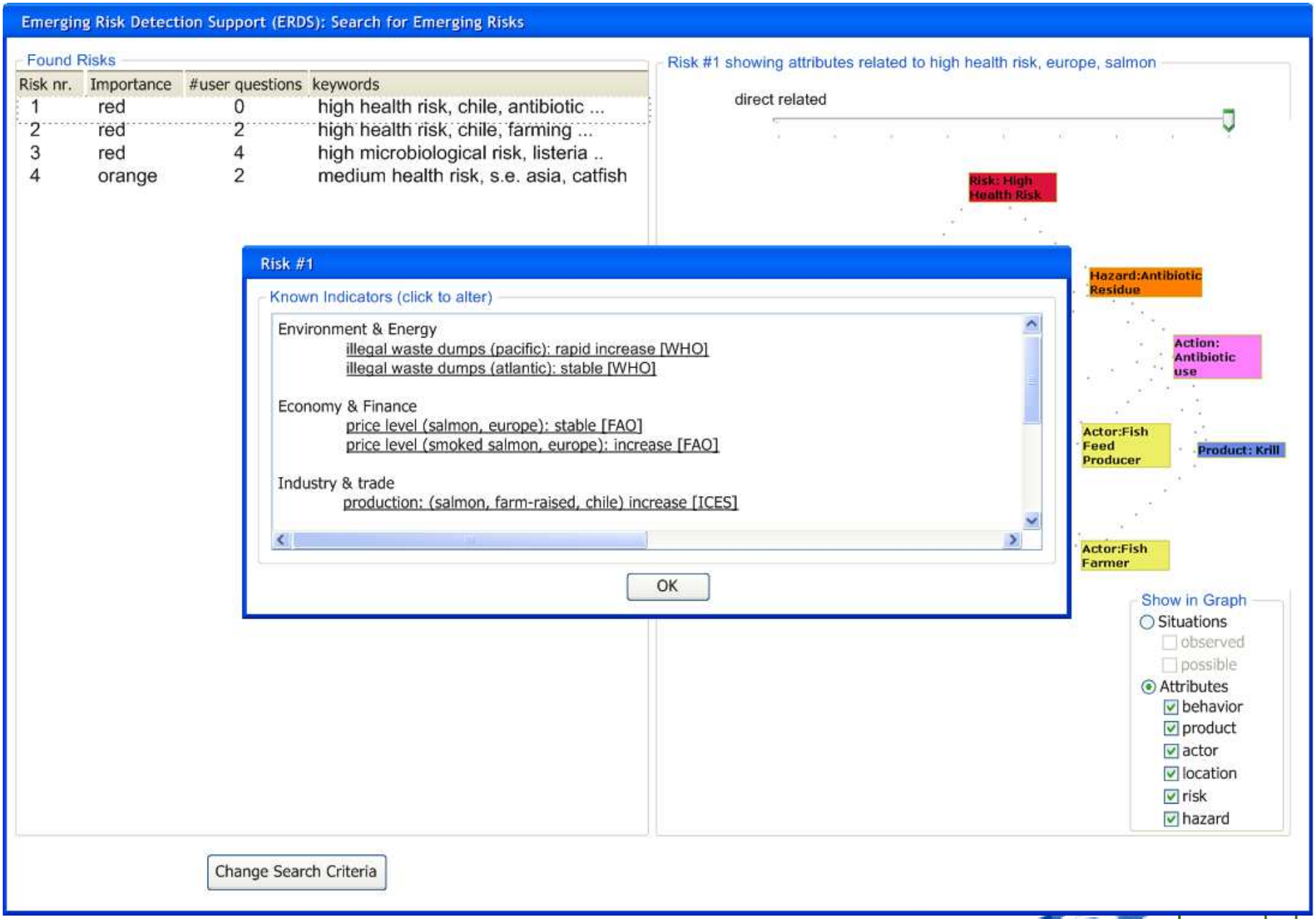


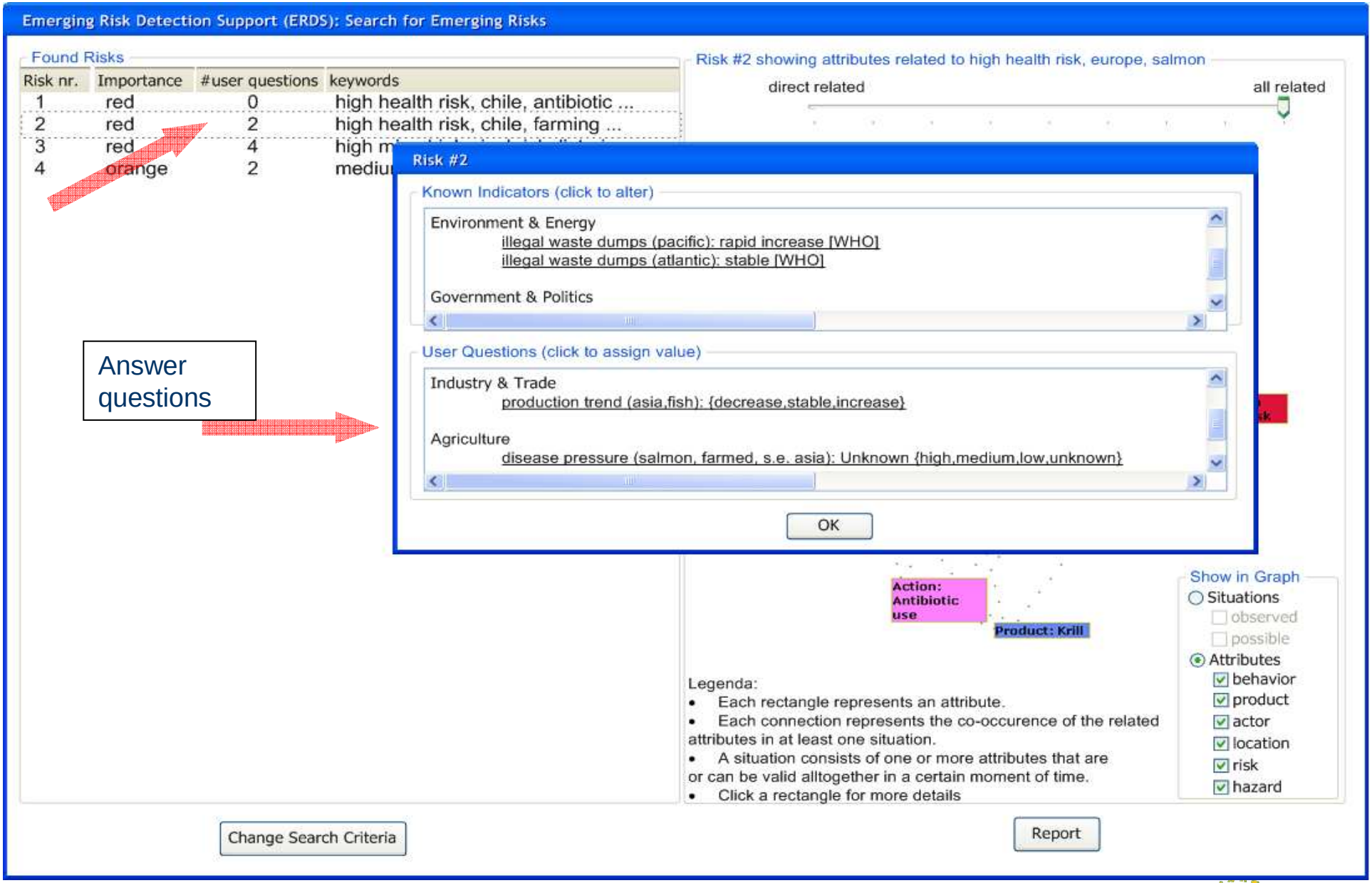
Source: Hulzebos et al. 2007

(button more info on topic fish)



Source: Hulzebos et al. 2007


Emerging Risk Detection Support (ERDS): Search for Emerging Risks
Found Risks
Risk nr. Importance #user questions keywords
1 red 0 high health risk, chile, antibiotic ...
2 red 2 high health risk, chile, farming ...
3 red 4 high microbiological risk, listeria ..
4 orange 2 medium health risk, s.e. asia, catfish
Risk #1 showing attributes related to high health risk, europe, salmon
direct related
Risk: High Health Risk
Hazard:Antibiotic Residue
Action: Antibiotic use
Actor:Fish Feed Producer
Product: Krill
Actor:Fish Farmer
Risk #1
Known Indicators (click to alter)
Environment & Energy
illegal waste dumps (pacific): rapid increase [WHO]
illegal waste dumps (atlantic): stable [WHO]
Economy & Finance
price level (salmon, europe): stable [FAO]
price level (smoked salmon, europe): increase [FAO]
Industry & trade
production: (salmon, farm-raised, chile) increase [ICES]
OK
Show in Graph
Situations
observed
possible
Attributes
behavior
product
actor
location
risk
hazard
Change Search Criteria



Source: Hulzebos et al. 2007

start from system

Emerging Risk Detection Support (ERDS): Search for Emerging Risks

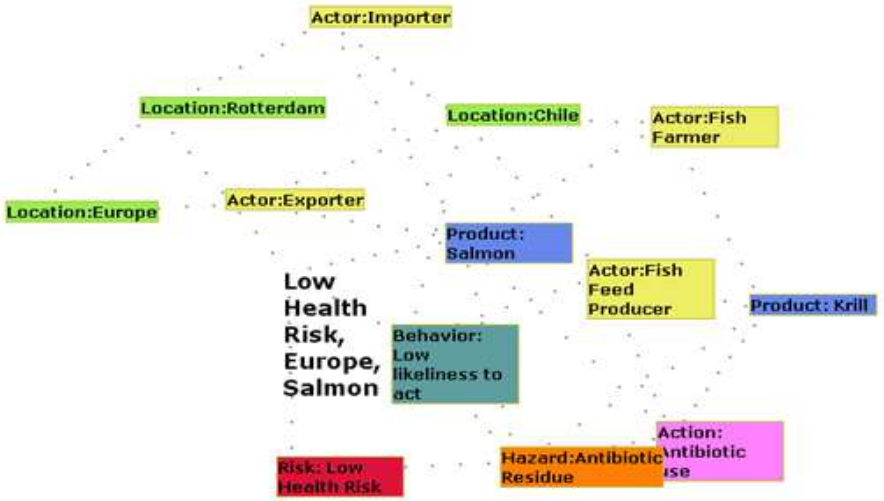
Found Risks

Risk nr.	Importance	#user questions	keywords
1	red	0	high health risk, chile, antibiotic ...
2	green	2	low health risk, chile, farming ...
3	red	4	high microbiological risk, listeria ..
4	orange	2	medium health risk, s.e. asia, catfish

Consequence of answers

Risk #2 showing attributes related to low health risk, europe, salmon

direct related — all related



Show in Graph
- Situations
  - observed
  - possible
- Attributes
  - behavior
  - product
  - actor
  - location
  - risk
  - hazard

Legenda:
- Each rectangle represents an attribute.
- Each connection represents the co-occurence of the related attributes in at least one situation.
- A situation consists of one or more attributes that are or can be valid alltogether in a certain moment of time.
- Click a rectangle for more details

Change Search Criteria

Report

Source: Hulzebos et al. 2007

Further questions to be answered

- What is the quality of the data sources?
- Is there a quantitative relationship between indicator(s) (data source) and the emerging risk?
- Can we make a generic method / procedure to identify emerging risks in the food and feed chain based on the indicators?

Thank you for your attention