The role of risk analysis for food security and nutrition in Armenia

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Yerevan, 2019
Abstract

1. Trends of environmental, health, and food-safety requirements (EHFSRs) along supply chains
2. The interrelationship between mandatory and voluntary EHFSRs
3. To improve nutrition, food safety and food security, throughout the life-course, and in support of public health and sustainable development
Escalating Food Safety Requirements

Key Reasons

“Perception” on recent food scares and scandals

Risk and cost minimization management by major retailers

Demographic developments in OECD countries

More sophisticated detection and testing methods
Drivers of Private-sector Safety Requirements

- Governments “Name and Shame” policy in some countries.
- Retailers legal responsibility (due diligence legislation in some countries) and increasing retailer own labels.
- Retailers do not want to compete on the basis of “who’s food is safer”.
- Risk-based food safety management systems.
- New food-safety, health and environmental requirements are being used as value-chain governance tools.
GLOBAL TRENDS

1. RISK BASED SYSTEMS

2. COMPLEX APPROACHES
   (from farm to fork, traceability)

3. INTERGOVERNMENTAL APPROACH
WHAT IS RISK ASSESSMENT (RA)?

- Process or tool for identifying a hazard and estimating the risk presented by that hazard
- Widely used in the field of food safety and security
- Supports decision making and resource allocation – risk management
- Approach adopted internationally e.g. EU, WHO (Framework)
No food security without good data

Statistics and capacity to measure and analyze food security remain wanting
What kind of data we need?

- Issues in measuring and analyzing food security
  - Thematic: availability, access, utilization, stability
  - Spatial: global, national, individual
  - Temporal: acute, chronic
Data and instrument

- Agricultural sample surveys
- Household consumption surveys
- Health/nutrition surveys
- Welfare Monitoring Surveys (WMS)
- Nutrition surveys (24-hour)
- Comprehensive Food Security Vulnerability Assessments

In addition to:
- Georeferenced data (satellite/NDVI, roads, weather)
Optimizing the use of existing data

- Integrate data across space
  - geo-referencing
  - concentrate on same sampling areas
- Integrate across data instruments
  - poverty mapping (household surveys)
- Integrate across time
  - Food security forecasting

... but also new and better data necessary!
Lack of standards results in poor comparability!

- Food Consumption ...
  - Diary vs. recall
  - Household vs. individual
  - Reference period
  - Nomenclature (COICOP)
  - Non-standard units of measure
  - Food consumed away from home (FAFH)
  - Valuation of consumed own-production

- How to better integrate data?
Mining industry is one of the priority branches of Armenian’s economy.
Transfer of trace elements from soil to plant
Health risk assessment of heavy metals in mining industry regions of Armenia

- The investigation aimed to carry out non-carcinogenic health risk assessment of trace elements (Cu, Mo, Ni, Cr, Pb, Zn, Hg, As, Cd) in some mining regions of Armenia, especially in Syunik region, where production of plant origin food is developed and produced fruits and vegetables are the major source of food for local population.

- Target hazard quotient (THQ) was calculated.

\[
\text{THQ} = \frac{E_F \times F_D \times \text{DIM}}{RfD \times W \times T}
\]

where,  
- \(E_F\) – exposure frequency,  
- \(F_D\) – exposure duration,  
- \(\text{DIM}\) – daily metal ingestion (mg/kg/day),  
- \(RfD\) – oral reference dose (mg/kg/day),  
- \(W\) – average body weight (kg),  
- \(T\) – average exposure time for noncarcinogens (365 day/year \(\times\) number of exposure years).
Health risk index (combined) for female

- Onion leaves
- Cabbage
- Basil
- Fennel
- Carrot
- Onion bulb
- Potato
- Beet
- Cucumber
- Tomato
- Eggplant
- Grape
- Plum
- Maize
- Peper sweet
- Bean

Colors represent different elements:
- Cu
- Mo
- Ni
- Cr
- Pb
- Zn
- Hg
- As
- Cd
17 pesticide residues (aldrin, DDT, dieldrin, ethylene dichloride, endrin, captafol, heptachlor, HCCH (sum), methyl parathion, methamidophos, mirex, parathion, pentachlorophenol, toxaphene, chlordane, chlordecone and phosphamidon) which are banned in Armenia were determined in fresh fruits and vegetables, in irrigation water and in agricultural soils.
DDT (sum.) concentrations in studied agricultural soils
and in soils from pesticide repository sites

(Dates of Ararat marz, RA)
Thank you for your attention.