

Potential Risks and Concerns associated with GM Crops

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What is Risk?

- **Risk** = hazard x exposure
 - Must have both **hazard** and **exposure** to have risk
- **Hazard** is the adverse effects on human health and /or environment
- **Exposure** is the likelihood of these adverse effects to occur
- There are two types of risks:
 - Fantasies
 - Real potential risks

Fantasy

mutant meals

Marie Claire, April
2000

Are you eating
science's mistakes?

eat, drink and be wary

Source: CropBiotech Net Collections

Real Potential Risks

Environmental issues

- Weediness and invasiveness: Genetic capability to established and persist outside cultivated fields
- Gene flow: Escape of genes to wild or weedy related species – **Distance & reproductive isolation**
- Non-target effects
- Pest resistance – **Insect Resistance Management**

Food/feed safety issues

- Toxicity
- Allergenicity
- Digestibility
- Unintentional nutritional and composition change
- Long-term stability
- Other unexpected effects
- **Substantial equivalence:** Food & feed derived from GM crops are thorough tested (by researchers, FAO + WHO) before commercial release to ensure that they are as safe and nutritious as those derived from traditional crops



Socio-economic and ethical concerns

- Monopoly of multinationals on price of GM seeds – involvement of public organizations
- Need to buy seed for every new planting season
- Reduced diversity, flexibility and resilience of farming systems – Conservation strategies
- Distribution of benefits and risks
- Patenting of living organisms
- “Playing God”: Since genes can be transferred between non-related species

Trade-related concerns

- International trade flow will depend on how traded the crop in question is.
- Labeling- EU requires labeling of all products containing 1% or more GM material
- Traceability requirements – add 6-17% farm costs
- Low competitiveness due to lack of enabling environment e.g. policies, regulatory packages, farmer subsidies
- Lack of IPR instruments such as plant breeders' rights

To Sum up on Concerns

- These risks and concerns are **not unique** to GM crops they were also experienced when hybrid seed and elite cultivars were introduced.
- Before a GM crop is approved for commercial release a **Risk Assessment** is done to:
 - Identify the risk,
 - Consider risk management strategies and
 - Compare the risks with the benefits.
- **Regulatory systems** play a big role in addressing most of these concerns

There is no
such thing as
"zero risk"



...but, how do we
minimize risk?



Way Forward

- Have in place biotech strategy & regulatory system
 - Biosafety Framework
 - Policy and Legislation
- Invest in human and infrastructural capacity
 - Universities and research institutions
 - Raise budgetary allocation to R&D
 - **Enhance Biotechnology education & communication**
- Develop support services
 - Intellectual Property and Technology Transfer initiatives
 - Socio-economic studies
 - **Stakeholder dialogue, information-sharing**

Thank you for your Attention