PSP, the Philippine Dragon Boat Team and DA's Role in Defining Food Safety Policy

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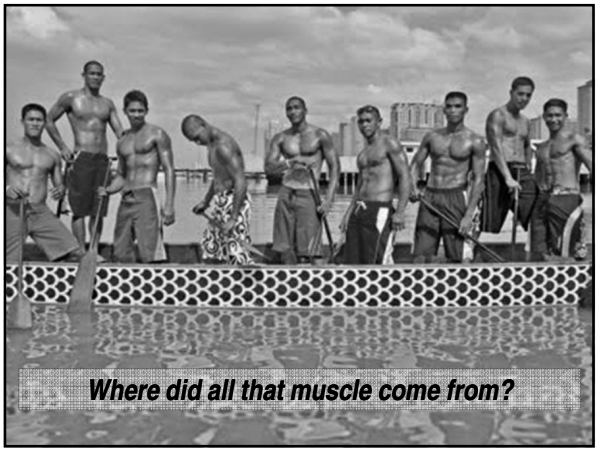
The Philippine Dragon Boat paddlers in action…



Where did all that muscle come from?

Members of the Philippine Dragon Boat team were pushed to dire straits after their mother group, the PDBF, was stripped of its status as a national sports association by the POC.

This removed a major source of funding for the paddlers, forcing them to eat tahong from Manila Bay while saving funds for their trip to the World Dragon Boat Championships in Florida.

They ended up winning 5 golds and 2 silvers.

Dennis Gasconia, abs-cbnNEWS.com,08/18/2011

MANILA, Philippines – Philippine Sports Commission (PSC) Chairman Richie Garcia said that if the Philippine Dragon Boat paddlers still refuse to join the Philippine Canoe-Kayak Federation (PCKF), then they will have to go back eating tahong or mussels.

Mussels (Perna viridis)

- ***nutritious, delicious, highly prized as food***
- ***low-cost protein source rich in essential amino acids (arginine, leucine, lysine)***
- ***low in calories, requires mastication***
- ***high in Fe, Zn, P, Ca, Cu, Se, I_2, folic acid, other B vitamins (B12), vitamins A, E***

But…..
Mussels (Perna viridis) - health risks

- ***paralytic shellfish poisoning***
- ***bioaccumulate heavy metals, organochlorines (DDT, chlordane, PCBs)***
- ***faecal E.coli, Salmonella, Vibrio spp.***
- ***parasites***
- ***allergens***

What has been done to manage PSP?
Are the Philippine Dragon boat paddlers adequately protected from PSP and other mussel-borne health risks?
Who will be accountable for the consequences if they and the rest of tahong consumers are not?

National Red Tide Task Force (NRTTF)

- ***created in 1988 by the Inter-Agency Committee on Environmental Health-DOH in response to HAB outbreaks***
- ***composed of different government agencies, academic institutions***
- ***chaired by the Bureau of Fisheries and Aquatic Resources***
- ***mandate: monitor toxic red tides to***
  - ***to protect public from illness and death due to red tide toxin***
  - ***mitigate negative impact to shellfish industry***

BFAR alerts triggered by

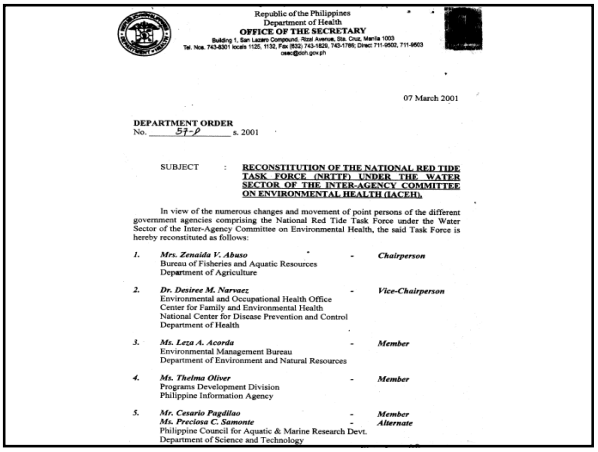
- ***HABs – indicate toxin production potential better, i.e. Pyrodinium bahamense levels in seawater (500 cells/L)***
- ***STX ≥ regulatory limit of 60 µg/100 g mussel meat (Perna viridis serves as sentinel sp. for PSP monitoring)***

How are these triggers defined?

National Red Tide Task Force (NRTTF)

- ***interim: regular red tide updates***
- ***ultimate goal: minimize, if not, stop PSP occurrence during toxic HAB outbreaks with effective management decentralized to the provincial level through policies***
  - ***based on data collected through time by BFAR, LGUs***
  - ***that guide red tide managers especially LGUs***

What are these policies?



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07 March 2001

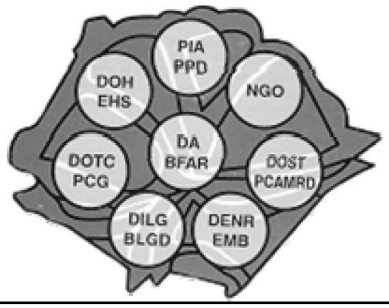
DEPARTMENT ORDER
No. 57-2 s. 2001

SUBJECT : **RECONSTITUTION OF THE NATIONAL RED TIDE TASK FORCE (NRTTF) UNDER THE WATER SECTOR OF THE INTER-AGENCY COMMITTEE ON ENVIRONMENTAL HEALTH (IACEH).**

In view of the numerous changes and movement of point persons of the different government agencies comprising the National Red Tide Task Force under the Water Sector of the Inter-Agency Committee on Environmental Health, the said Task Force is hereby reconstituted as follows:

1. ***Mrs. Zenaida V. Abuso*** - ***Chairperson***
   Bureau of Fisheries and Aquatic Resources
   Department of Agriculture
2. ***Dr. Desiree M. Narvaez*** - ***Vice-Chairperson***
   Environmental and Occupational Health Office
   Center for Family and Environmental Health
   National Center for Disease Prevention and Control
   Department of Health
3. ***Ms. Leza A. Acorda*** - ***Member***
   Environmental Management Bureau
   Department of Environment and Natural Resources
4. ***Ms. Thelma Oliver*** - ***Member***
   Programs Development Division
   Philippine Information Agency
5. ***Mr. Cesario Pagdilao*** - ***Member***
   Ms. Preciosa C. Samonte - ***Alternate***
   Philippine Council for Aquatic & Marine Research Devt.
   Department of Science and Technology

National Red Tide Task Force
Inter-Agency Committee on Environmental Health
Department of Health
Manila, Philippines



More info…

Mussels (Perna viridis)

- ***fast growing, spawning year-round (every 2 mos.), changes sex for reproduction***
- ***4 to 6 mos. maturation***
- ***↑ returns, requiring neither highly sophisticated technologies nor highly skilled labor***
- ***export potential (as snacks)***
- ***shells a source of chitin, other high-value chemicals***
- ***economically important (e.g. P100 M/yr, Sorsogon Bay)***

Collateral socio-economic damage
- *1992 HAB Manila Bay outbreak → 38,500 fisherfolk displaced for 4 mos*
- *1983 HAB outbreak – P2.2 M lost*
- *↓ fish consumption, prices ↓ by 40%*
- *import bans on Philippine shrimp*

Socio-economic risk management - whose mandate?

The Department of Agriculture is the principal agency of the Philippine government responsible for the promotion of agricultural development growth. In pursuit of this, it
- *provides the policy framework,*
- *helps direct public investments, and*
- *in partnership with local government units (LGUs) provides the support services necessary*

to make agriculture and agri-based enterprises profitable and to help spread the benefits of development to the poor, particularly those in rural areas

Department of Health

Vision - The leader of health for all in the Philippines

Mission - Guarantee equitable, sustainable and quality health for all Filipinos, especially the poor, and to lead the quest for excellence in health

The ultimate goal of the NRTTF falls within the core task and core competence of the DOH.

Is the creation of the NRTTF consistent with internationally accepted principles covering its ultimate goal of food safety?

Risk assessment in the international food policy arena (Jackson and Jansen, 2006)

National food safety measures
- *implemented by governments to control risks inherent in food consumption*
- *concerned primarily with the health and safety of its own citizens in relation to domestically distributed food, whether locally produced or imported (N.B. NRTTF ultimate goal)*
- *with liberalized food trade, national food safety policies underpinned more and more by international trade concerns*

Having paved the way for developing countries to trade their way out of poverty, agricultural trade liberalization brings to the fore the economic impact of food safety (Käfferstein, 2003).

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

ASSURING FOOD SAFETY AND QUALITY:

GUIDELINES FOR STRENGTHENING NATIONAL FOOD CONTROL SYSTEMS

GUIDELINES FOR STRENGTHENING NATIONAL FOOD CONTROL SYSTEMS

Principles of Food Control:
- ***integrated (farm-to-table) prevention***
- ***risk-based decision-making***
- ***transparency***

Codex CCFICS
- ***joint responsibility - food business operator (FBO) and competent authority***
- ***coordination and cooperation***
- ***consistency and impartiality***
- ***harmonization***
- ***equivalence recognition***

NRTTF - consistency with international principles of food safety
- ***DOH initiated***
- ***chaired by BFAR-DA (delegation)***
- ***LGU involvement (decentralized)***
- ***responsibilities delineated***
  - ***monitoring by BFAR, LGUs***
  - ***ban issued jointly by DOH, DA***
  - ***AO 1 (1997) shellfish harvesting, gathering, transport and sale regulated by DA, DOH and DILG***
  - ***alerts by BFAR***

Economic consequences demand strong basis for trigger.

FOOD SAFETY
- ***definition***
- ***policies***

Food safety hazard (e.g. STX)

↓

<u>Possible</u> adverse effect

(But decision making requires knowing risk, i.e. probability and severity of the adverse effect.)

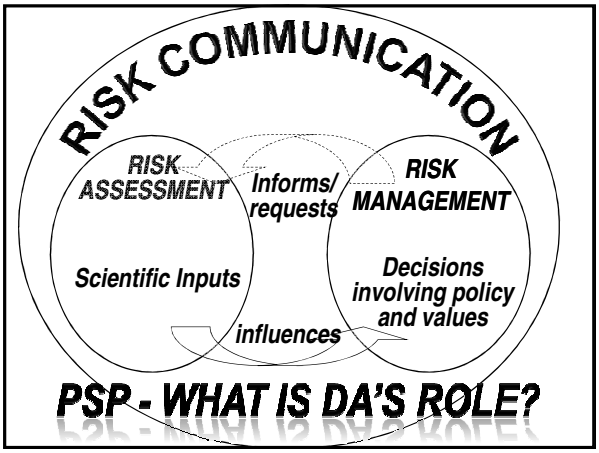
RISK-BASED (why?) DEFINITION

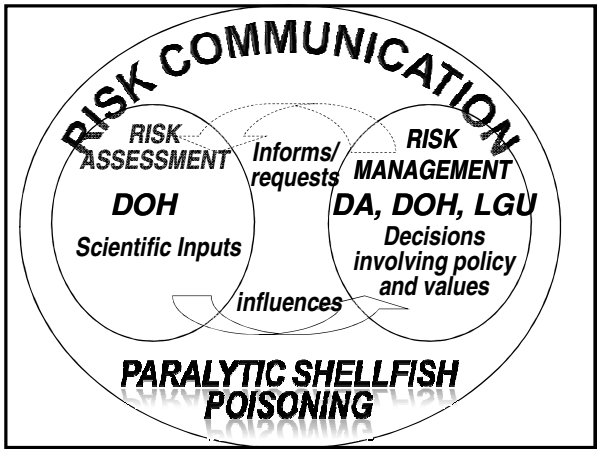
Food safety is the assurance that available food, if used as intended, does not pose any unacceptable risk to human health.

(Lizada, 2010)

Risk analysis
- ***provides the scientific basis for food safety measures***
- ***a deliberate, structured and formalised approach to understanding and, where necessary, reducing risk (ILSI-EU, 1998)***

Risk analysis consists of three distinct but highly interactive and iterative processes
1. ***estimating the risks to human health and safety (risk assessment);***
2. ***identifying and implementing appropriate measures to control or mitigate these risks (risk management); and***
3. ***communicating with all stakeholders about food-borne risks and control measures applied***



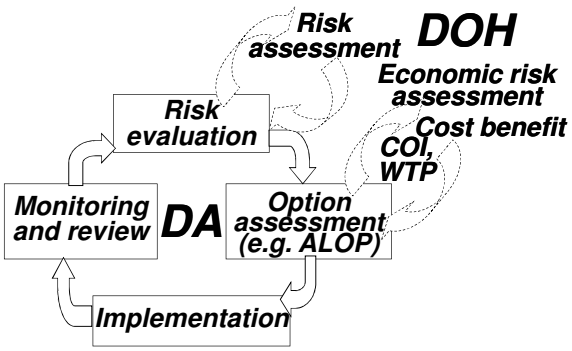


Risk-based definition provides for
- ***delineation of roles***
- ***effectiveness, efficiency in assuring food safety (preventive approaches, risk-based inspection)***
- ***compliance with SPS provisions***
- ***appropriate policies***
- ***measureable, science-based outcomes***

Codex Alimentarius 20th Procedural Manual (2011)

While recognizing the dual purposes of the Codex Alimentarius are protecting the health of consumers and ensuring fair practices in the food trade, Codex decisions and recommendations on risk management should have as their primary objective the protection of the health of consumers.

Risk management should take into account the economic consequences and the feasibility of risk management options.



Risk management cycle

Risk matrix – a risk evaluation tool

		CONSEQUENCE (SEVERITY)				
		1	2	3	4	5
	People	Negligible injury, no absence from work	2. Minor illness, no hospitalisation	3. Major outbreak: small number hospitalised	4. Major outbreak: large number hospitalised	5. One or more fatalities
	Reputation	1. No media attention, no changes in consumer behaviour	2. Local media attention and short term local market damage	3. National media attention, short term national market damage	4. Major incident and long term national market damage	5. Major incident and long term international market damage
	Societal Cost	1. Negligible (< £10K)	2. Minor (> £10K < £100K)	3. Significant (> £100K < £1M)	4. Major (> £1M < £3M)	5. Extreme (> £3M)
FREQUENCY (LIKELIHOOD) 5	Almost inevitable that an incident would result (every month)				Intolerable Risk	
4	Not certain to happen but an additional factor may result in an incident (happens several times every year)					
3	Could happen when additional factors are present but otherwise unlikely to occur (happens once a year)			Incorporate risk reducing measures		
2	A rare combination of factors would be required for an incident to result (happens once every 10 years)		Manage for continued improvement			
1	A freak combination of factors would be required for an incident to result (happens once every 100 years)					

Comer, 2004

"Members shall ensure that any sanitary or phytosanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, is based on scientific principles and is not maintained without sufficient scientific evidence…."

The WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) – Article 3. Harmonization
http://www.wto.int/english/tratop_e/sps_e/spsagr_e.htm

3. Members may introduce or maintain sanitary or phytosanitary measures which result in a higher level of sanitary or phytosanitary protection than would be achieved by measures based on the relevant international standards, guidelines or recommendations, if there is a scientific justification…

Paralytic shellfish poisoning (PSP)

- ***human lethal dose 1 - 4 mg STX, with clinical symptoms at 0.72 mg***
- ***clearance in humans – rapid («24 h); fatality rare with available medical support***
- ***US, EU mandated regulatory limit in shellfish - 80 µg STX /100 g, reflecting a 10-fold uncertainty factor relative to the lowest observable adverse effect level (LOAEL)***
- ***regulatory limit – internationally accepted; successful public health protection in US***

Paralytic shellfish poisoning (PSP)
2009 - Scientific Panel on Contaminants in the Food Chain (CONTAM Panel) of the European Food Safety Authority (EFSA) considered the following:

- ***acute reference dose (ARfD) of 0.5 µg STX equiv./kg b.w. (30 µg STX equiv. per portion for a 60 kg adult)***
- ***for a 60 kg adult to avoid exceeding ARfD, a 400 g portion of shellfish should contain ≤ 30 µg STX equiv. or 75 µg STX equiv./kg shellfish meat***
- ***no comment on risks in consuming shellfish currently in the market***
- ***uncertainties in risk assessment need to be communicated***

PSP – Philippine situation

- need to identify susceptible populations, do exposure assessment (consumption)
- Philippines – ca. 2000 cases 1983-1998, with a mortality rate of 5.8%
- 80 µg/100 g meat – PSP persistence esp. in victims <20 yrs (Hartigan-Go, 1991)
- initial regulatory limit - 40 µg STX/100 g meat (limit of detection in standard mouse bioassay, no uncertainty factor)
- recently revised to 60 µg STX/100 g meat
- mussels - popular "recreational" food for parties, picnics, drinking sessions

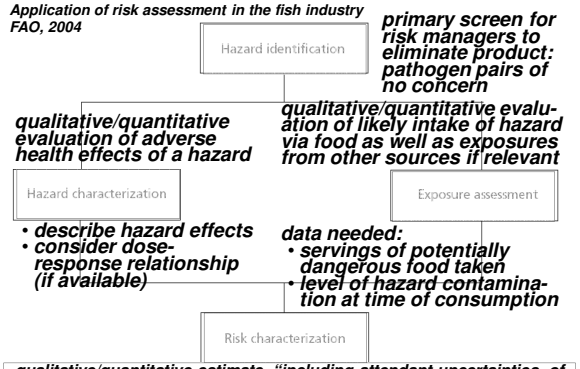
Is the Philippine regulatory limit science-based, legally defensible?

RISK ASSESSMENT

- estimates level of illness expected in a target population from consuming a contaminated product or group of products
- requires highly specialized expertise, e.g.
  - food microbiologists, pathologists, epidemiologists to cover microbial hazards
  - chemists, toxicologists - chemical hazards
  - chemists, internists - physical hazards
- primary producers – not likely to be directly in-volved, but assessors should ensure that assessment output is accessible to and understood by primary producers

Application of risk assessment in the fish industry FAO, 2004

Application of risk assessment in the fish industry FAO, 2004



qualitative/quantitative estimate, "including attendant uncertainties, of probability of occurrence and severity of known or potential adverse health effects in a given population based on" above processes

Risk assessment: The principal scientific basis for risk management and risk communication

Risk management also involves making provisions for building capacity in risk assessment.

The Departments of Health, Agriculture and Science and Technology provide for this, drawing expertise from within and from academe (e.g. toxicologists, epidemiologists).

(modified from WHO, 1996)

Safe Food for All

SHARED RESPONSIBILITY			
Good Practices: Primary Producers/Distributors	Food Legislation and Enforcement	Knowledgeable Graduates	Educated/Knowledgeable Public
QA and Control of Processed Food	Advice for Industry/Trade	Consumer Education	Discriminating/Selective Consumers
Appropriate Processes and Technology	Consumer Education	Expert Advice to Government	Safe Food Practice in the Home
Trained Managers and Food Handlers	Information Gathering/Research	Expert Services to Industry	Community Participation
Informative Labeling and Consumer Education	Provision of Health-Related Services	Research	Active Consumer Groups
INDUSTRY/TRADE	GOVERNMENT	ACADEME	CONSUMER

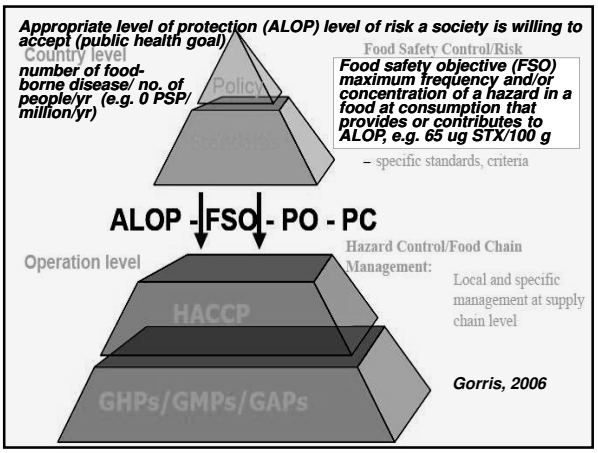
FOUR PILLARS OF THE NATIONAL COMMITMENT TO FOOD SAFETY

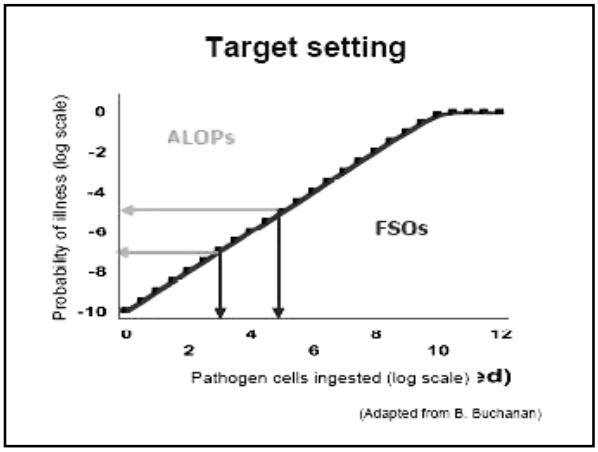
WHO LEADERSHIP FOR INTERNATIONAL CONSENSUS ON FOOD SAFETY ISSUES, POLICIES AND ACTIONS

How is risk analysis linked to food safety policy?

Policy (ILRI, 1995)

- ***"usually implies some long-term purpose in a broad subject…."***
- ***"fairly cohesive set of responses to a problem…."***
- ***"government development activities…policies, plans, programmes and projects, …in succession being a little more short-term, more specific in place and timing than the previous and each successively more executive rather than legislative."***



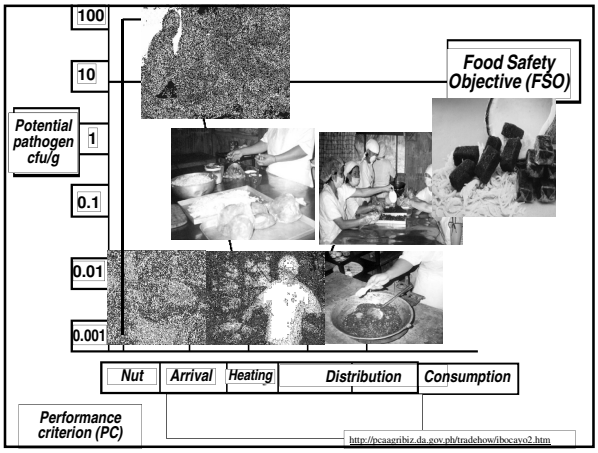


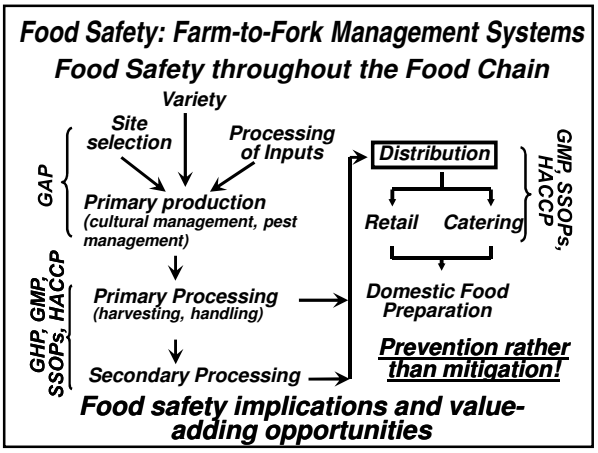
Performance Objective (PO) - maximum frequency and/or concentration of a hazard at a specified step in the chain before consumption that still provides or contributes to the achievement of an FSO or ALOP, as applicable

Performance Criterion (PC) – parameter to control to meet or contribute to meet a PO

Control Measures (CM) - any action used to prevent or eliminate a food safety hazard or to reduce it to an acceptable level

Modified from ***Gorris, L. 2004. Performance objectives and performance criteria – Two sides of the food chain. Mitt. Lebensm. Hyg. 95, 21–27.***





1995 UNDP-DOST report, subsequent PCARRD EPPMI (late 90's) – IPM single most significant impact on cost and residues; currently promoted

Pesticide use
- *demand for quality produce from consumer (largely aesthetic)*
- *need to protect farmers' investment (land, seed, labor, water, fertilizer, etc.)*
- *GAP recommendations*
  - *farmers' guidance*
  - *benchmark (regulators, consumers) to determine safe practices*
- *however, among vegetable farmers*
  - *spray frequency - 12-20 times per season at 2-3 days interval*
  - *harvest - 2-3 days after application*

Mitigation - effect of washing and cooking on insecticide residues in sitao (UPLB, 1980)

Residues (mg/kg)			
Insecticide (MRL in mg/kg)	Unwashed Beans		
	Fresh	Cooked	Soup
Methyl parathion (0.2)	0.6	0.28	0.02
Diazinon (2)	0.73	0.47	0.004

Material Safety Data Sheet (MSDS) provides information on product safety.

Insecticide (MRL in mg/kg)	Washed Beans		
	Fresh	Cooked	Soup
Methyl parathion (0.2)	0.16	0.14	0.012
Diazinon (2)	0.33	0.01	0.008

Opinion of the Scientific Panel on Contaminants in the Food chain on a request from the European Commis-sion to perform a scientific risk assessment on nitrate in vegetables, The EFSA Journal (2008)Journal number, 689, 1-79.

Nitrate
- *naturally occurring*
- *used as a fertilizer*
- *can be an environmental contaminant*
- *an approved food additive*
- *ADI of 0-3.7 mg/kg body weight*
- *exposure routes for humans:*
  - *endogenous formation*
  - *exogenous exposure from dietary (vegetables, preserved meat and drinking water) and non-dietary sources*

Benefit characterization
- *physiological roles of endogenous nitrate and metabolites*
- *contribution of exogenous nitrate to above role not established*
- *balanced diet high in vegetables and fruit → significant health benefits*

Risk/benefit characterization
- *appreciable health risks unlikely to arise from exposure through vegetables in diet*
- *benefits of vegetable in diet prevail*
- *unfavorable production conditions for vegetables constituting a large part of diet (especially for arugula) need to be assessed on a case by case basis*
- *need moderation, variety, balance*

Dioscorine, an alkaloid
- *CNS depressant*
- *also found in wild yam (`nami'. `kayos'. `kuyot', `kurot'), which serves as an alternate staple in times of drought*