



ADI India: Monocrotophos

Monocrotophos mayhem

Estimating exposure to this pesticide for a 60 kg adult (below), and a 10 kg child (below, right)

Food commodity	Indian MRL (mg/kg)	Diet (gm/day)	Pesticide intake (mg/day)	Distribution* (per cent)
Wheat	0.025	158	0.0040	2.6
Rice	0.025	209	0.0052	3.5
Cereals, other	0.025	77	0.0019	1.3
Pulses	0	29	0.0000	0.0
Potatoes	0.05	43	0.0022	1.4
Tomatoes	0.2	20	0.0040	2.7
Onions	0.1	15	0.0015	1.0
Vegetables, other	0.2	160	0.0321	21.2
Condiments and spices	0	5	0.0000	0.0
Oranges & citrus fruits	0.2	20	0.0038	2.5
Other fruits	1	92	0.0921	61.0
Meat and poultry	0.02	14	0.0003	0.1
Eggs	0.02	4	0.0001	0.1
Milk	0.02	179	0.0036	2.4
Sugar & sweeteners ¹	0	105	0.0000	0.0
Animal fats	0.02	6	0.0001	0.1
Vegetable oil & crops ²	0	45	0.0000	0.0
Tea, coffee and cocoa	0	2	0.0000	0.0
Total pesticide intake			0.1510	
ADI			0.0360	
Per cent of ADI			419	

Food commodity	Indian MRL (mg/kg)	Diet (gm/day)	Pesticide intake (mg/day)	Distribution* (per cent)
Cereals	0.025	119	0.0030	9.8
Leafy vegetables	0.2	7	0.0013	4.4
Roots & tubers	0.05	38	0.0019	6.3
Other vegetables	0.2	16	0.0032	10.6
Fruits ³	0.86	20	0.0175	57.6
Meat, Fish & egg ⁴	0.012	10	0.0000	0
Milk & milk products	0.02	164	0.0033	10.8
Pulses	0	20	0.0000	0
Sugar & sweeteners	0	19	0.0000	0
Oil and fats	0.02	7	0.0001	0.5
Condiments & spices	0	4	0.0000	0
Total pesticide intake			0.0305	
ADI			0.0060	
Per cent of ADI			508	

Note: Monocrotophos JMPR ADI = 0.0006 mg/kg of body weight

*This means: the proportion of pesticide intake through different food items.

1 There is MRL for sugar beet, but none for sugarcane. Therefore MRL assumed as 0. This is an under-estimation.

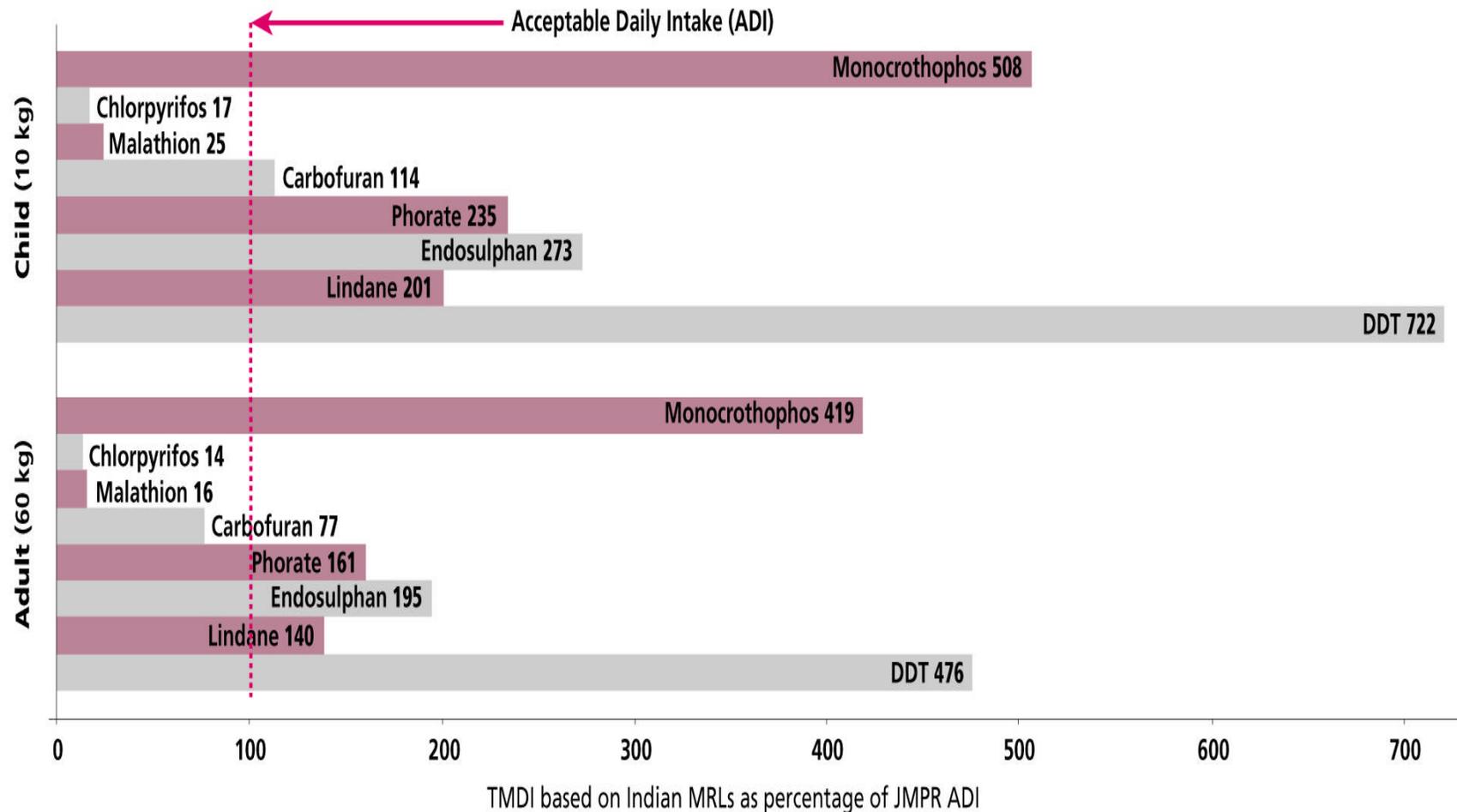
2 There is MRL for cotton seed oil but data for consumption not available there for assuming MRL as 0. This is an under-estimation.

3 Consumption data for fruits not available separately. MRL for fruits is weighted MRL of citrus fruits and other fruits using consumption pattern as per FAO 2001 FBS.

4 Separate consumption data not available. MRL for meat, fish and egg is weighted MRL, using consumption pattern as per FAO 2001 FBS. This is an under-estimation.

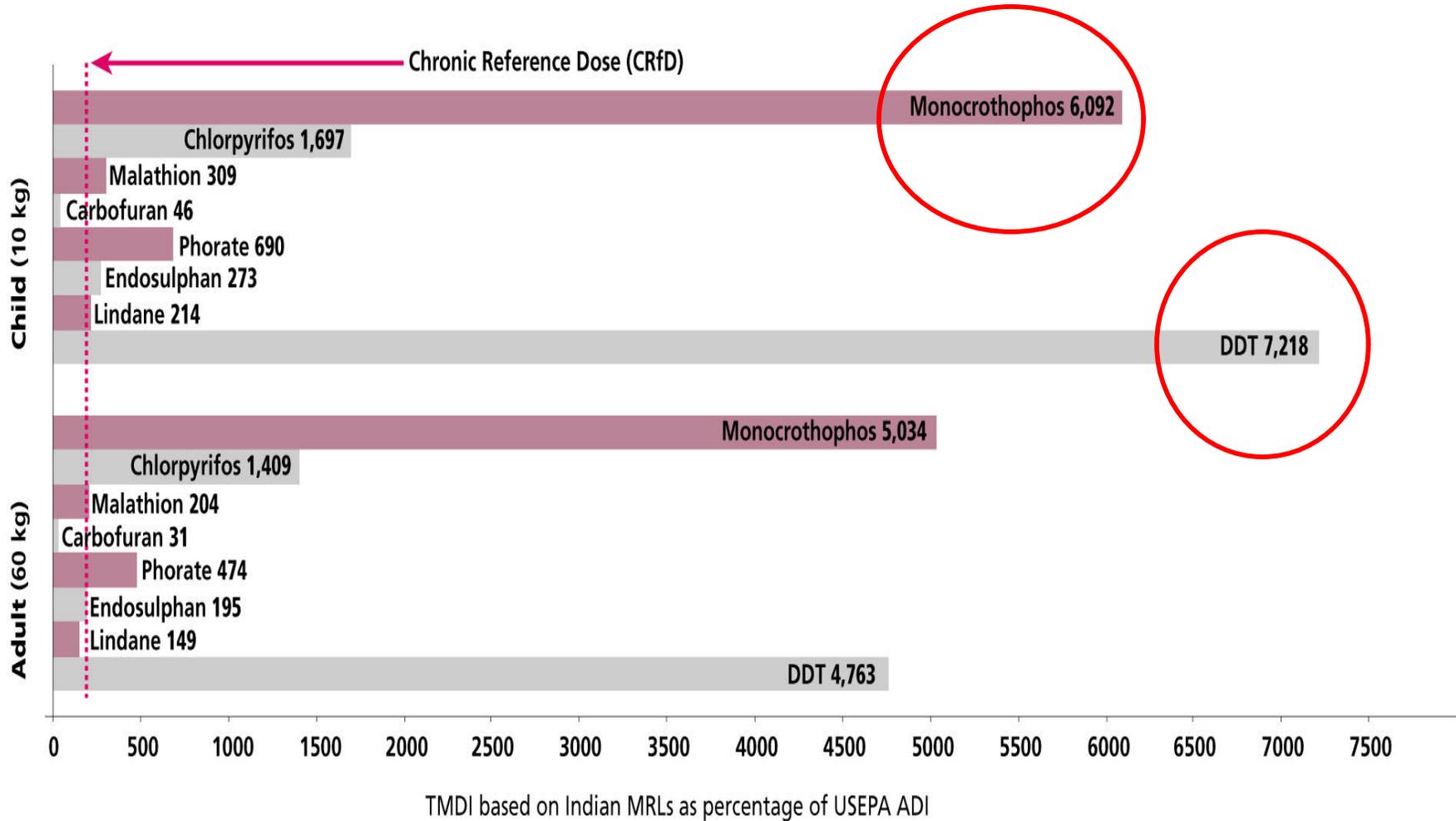


Indian legal exposure: if JMPR's ADI Considered





Indian legal exposure using **USEPA** **dose**





ADI cannot be exceeded.

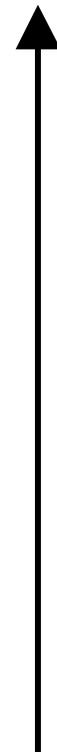
- ADI calculation **must** at the time of registration.
- If daily intake is below ADI. Pesticide will be registered.
- If intake exceeds ADI then:
 - A. Go back to MRL -- review and rework the legal limits allowed in food residues. Remove the use from some crops. **Adjust. Public health at stake.**
 - B. If ADI cannot be established, set the MRL at “no detection” – no residue allowed.



Improving estimation

- **If TMDI has space – less than ADI – can do more realistic estimations and if necessary increase MRL.**

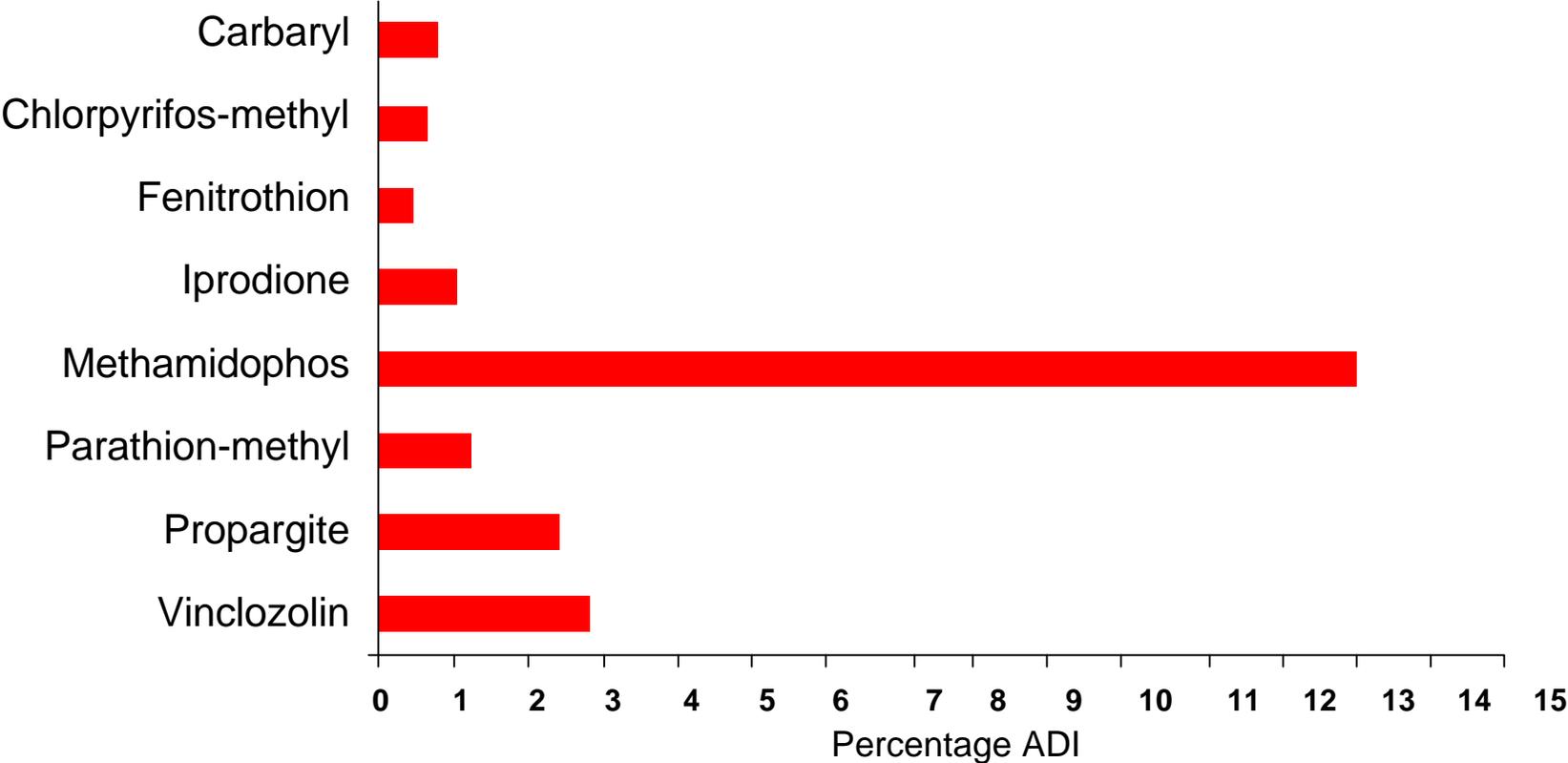
1.	Measured Pesticide Residue Intake (total diet study etc)
2.	Best estimate: Estimated Daily Intake (EDI)
3.	Intermediate Estimate: Estimated Maximum Daily Intake (EMDI)
4.	Crude estimate: Theoretical Maximum Daily Intake (TMDI)





Australia estimates on basis on EDI

We exceed ADI but Australia uses only 13% EDI





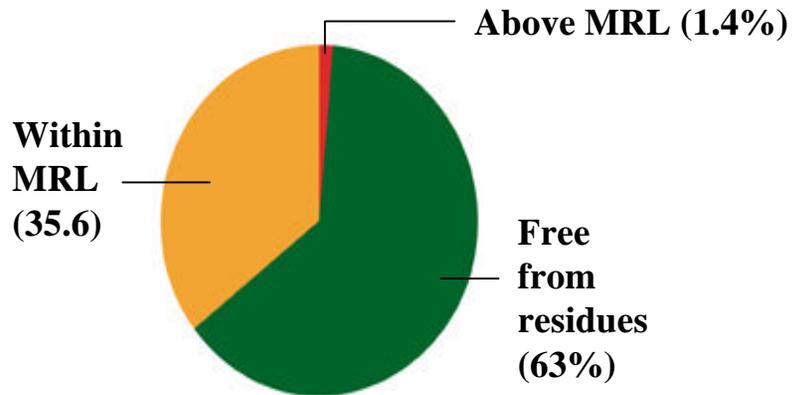
Actual pesticide exposure in India: More than TMDI???

- **Even if all commodities meet PFA's MRLs, We exceed ADI by large margin.**
- **Tests done indicate failure up to 100% in some states for food commodities. Average failure of samples 20 %.**
- **Therefore;**
- **If we estimate our actual intake – EDI – we will even exceed further.**

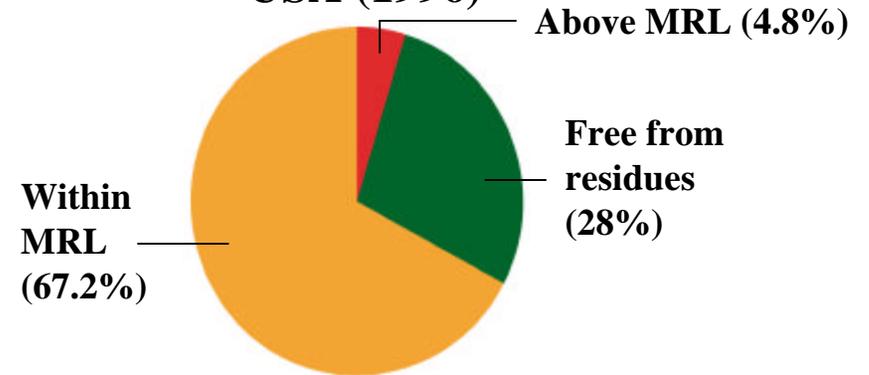


Actual exposures?

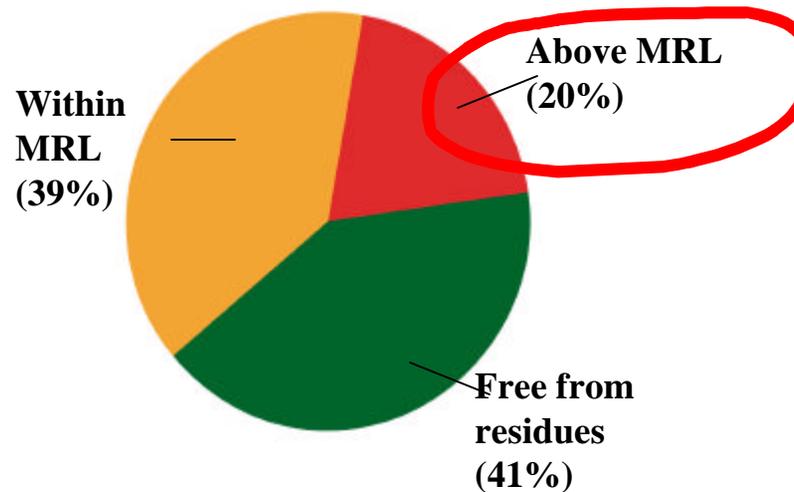
European Union (1996)



USA (1996)



India (1965-98)



Source:
G S Dhaliwal &
Balwinder Singh,
2000: 208



System works. Check..enforce..penalise

- **US: 6,523 samples tested and 4% failed;**
- **EU: 46,000 samples only 4% failed standards;**
- **Canada: 44,000 samples only 2% failed standards.**
- **Low MRL set. Strict enforcement. Regular surveillance.**
- **Their governments say that pesticides are not a health hazard because the exposure is much below ADI.**

- **They do not regulate pesticides in finished products like soft drinks, because they have cleaned up their act.**



Allow pesticide in soft drink?

- **Soft drinks are NEVER included in the global or national diet calculations.**
- **Our MRLs are very high... we even breach these high MRL... ADI exceeded manifold... pesticide quota over-consumed...**
- **No space for anything outside essential diet**
- **In this situation, no pesticide can be allowed in soft drinks (not part of essential diet)**



Allow pesticide in soft drink?

- You will have to decide.
- If you allow pesticide residue in soft drinks, you will have to **remove** some **essential food** item from our diet.
- Can soft drink substitute milk?
Can soft drink substitute fruit juices?
- The debate is not about **apple vs soft drink**, not about **milk vs soft drink**.
- **It's about a nutrition/poison trade-off.**



Pesticide in soft drink: Unsafe

- **Any pesticide residue in non essential item is unsafe in our situation.**
- **Be it CSE or CFTRI or CFL results, all have found pesticide residues.**
- **This is unacceptable and unsafe.**



Towards a pesticide policy

- **We do not calculate ADI.**
- **Shocking. Deadly.**
- **Need a review of the regulatory framework. Cannot allow the use of pesticides without stringent, science-based regulations.**
- **Industry wants weak regulations. Is getting it.**



Policy: Registration

- **Registration done by Central Insecticide Board and Registration Committee**
- **181 pesticides registered for use in the country;**
- **Lists the crops for which the pesticide is “recommended”.**
- **No provision for regular review and re-registration of existing pesticides;**
- **Most countries have this provision – from 2-10 years. Industry pays the full costs for re-registration.**



Registration: without MRLs

- **MRL setting at the time of registration is not compulsory;**
- **PFA specified MRLs for 71 pesticides out of 181 pesticides registered till date.**
- **MRL's for many registered pesticides not set_which makes the product with the residue, illegal and creates export problems.**
- **In US and EU, for instance, pesticides can only be registered if tolerance is set. It is part of the process.**



“Recommended” not legislated

- **The list of recommended pesticides by CIB at the time of registration is not matched with the MRL set for the particular crop.**
- **In tea, 9 recommended and 3 are regulated.**
- **In sugarcane 13 recommended and 4 are regulated.**



Enforcement and surveillance

- **Surveillance through the All India Coordinated Project.**
- **But no responsibility for enforcement.**
- **Data not in public domain. Often old data released. Data unused for enforcement.**
- **Data finds roughly 10-20 per cent samples above MRLs. In some states, samples fail by 50 per cent.**
- **Data for milk and milk products, honey and baby food extremely worrying. No corrective measures taken.**



Baby food: of concern

Table: DDT and HCH residues in baby milk powder

Brand No	Himachal Pradesh		Hyderabad		Kerala	West Bengal	Bangalore
	HCH	DDT	HCH	DDT	HCH	HCH	HCH
Brand I	3.734	1.470	0.578	0.226	0.251	0.522	0.225
Brand II	1.128	0.839	1.067	0.320	0.243	0.494	0.013
Brand III	1.886	0.344	0.415	0.042	0.354	0.142	0.081
Brand IV	2.863	0.468	0.458	0.021	0.241	0.694	0.071
Brand V	3.031	-	0.389	0.054	0.168	0.279	0.026

Source: NP Agnihotri 1999, *Pesticide safety evaluation and monitoring*, All India Co-ordinated Research Project on Pesticide Residues, Division of Agricultural Chemicals, Indian Agricultural Research Institute, New Delhi, p 107.



Enforcement..

- **Enforcement responsibility for Central and state laboratories under PFA.**
- **No public disclosure of data for enforcement. EU publishes annual report on analysis of its programme and action taken.**
- **Started programme on “naming and shaming” suppliers and wholesale agencies where samples exceed MRLs.**
- **In US, EPA sets tolerances. FDA enforces tolerances. Extensive annual programme to check and enforce.**
- **Conducts Total Diet Study – to check residues in prepared food.**



No 'right' to clean water

- **55 years after Independence we do not have legal rights to clean water.**
- **Why? Because standards for what is “clean” water are not legal.**
- **What is “potable” water? What is “wholesome” water?**
- **For this we need standards for each parameter for what constitutes “safe” water.**
- **Then we need a law that enforces these standards so that agencies supplying water are held responsible. Citizens then have the “right” to clean water.**