



UNIVERSITÀ DEGLI STUDI DI MILANO  
DIPARTIMENTO DI SCIENZE  
FARMACOLOGICHE E BIOMOLECOLARI



COLTURE MINORI: STRATEGIE PER IL CORRETTO CONTENIMENTO DELLA FLORA INFESTANTE

POTENZIALE ESPOSIZIONE (RISCHIO) DELL'UOMO IN RELAZIONE  
ALL'IMPIEGO DEGLI ATTUALI ERBICIDI USATI SULLE COLTURE MINORI ?

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# PUBLIC HEALTH and RISK ANALYSIS



# HAZARD



Hazard is the potencial capacity of producing harm.



# RISK



Risk is proportional to both the hazard and the extent of exposure.

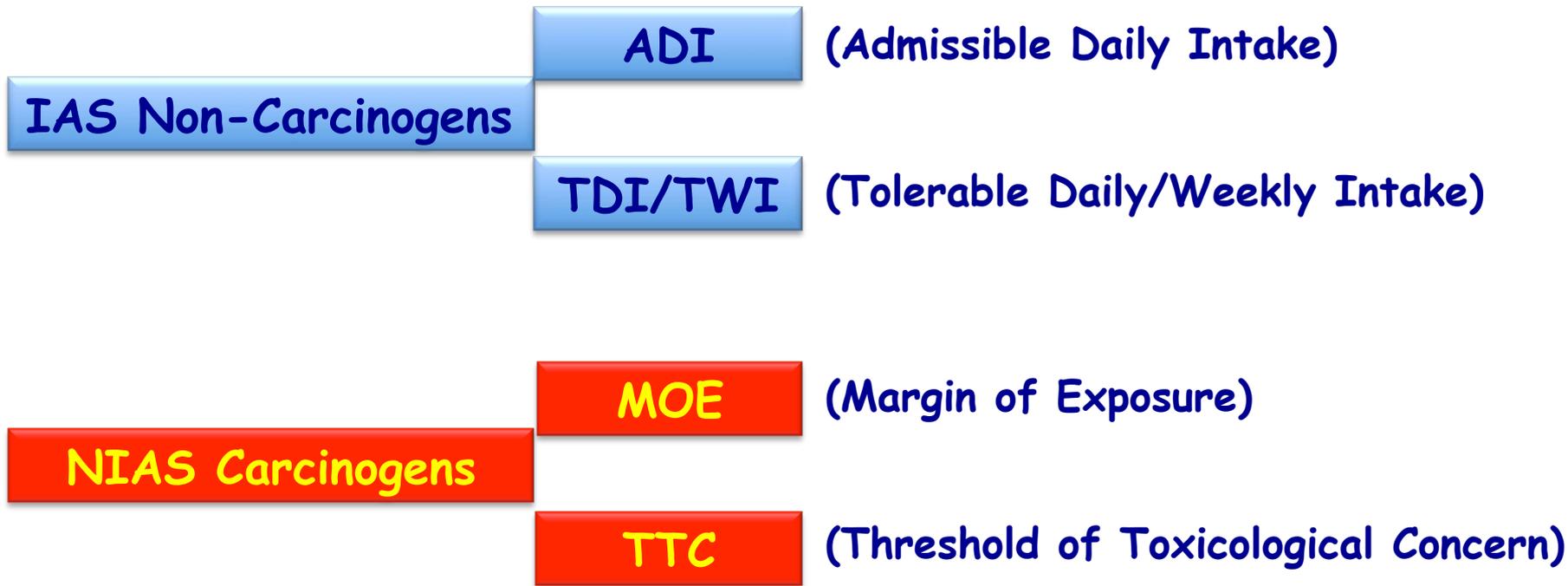


# RISK ANALYSIS

- ☑ Risk analysis is highly regulated at global level. (i.e. WHO, EFSA, FDA, EC etc. etc.)
- ☑ No chemicals can be marketed without safety assessment and approval
- ☑ Safety assessment is undertaken PRIOR to approval
- ☑ The applicant (industry) provides the safety data, which have to be performed to defined quality standards (GLP, QA, OECD, UE guidelines.....)
- ☑ The scientific Panels - which include scientists and regulators with a wide range of expertise - are responsible for setting quantitative **Health Based Guidances**

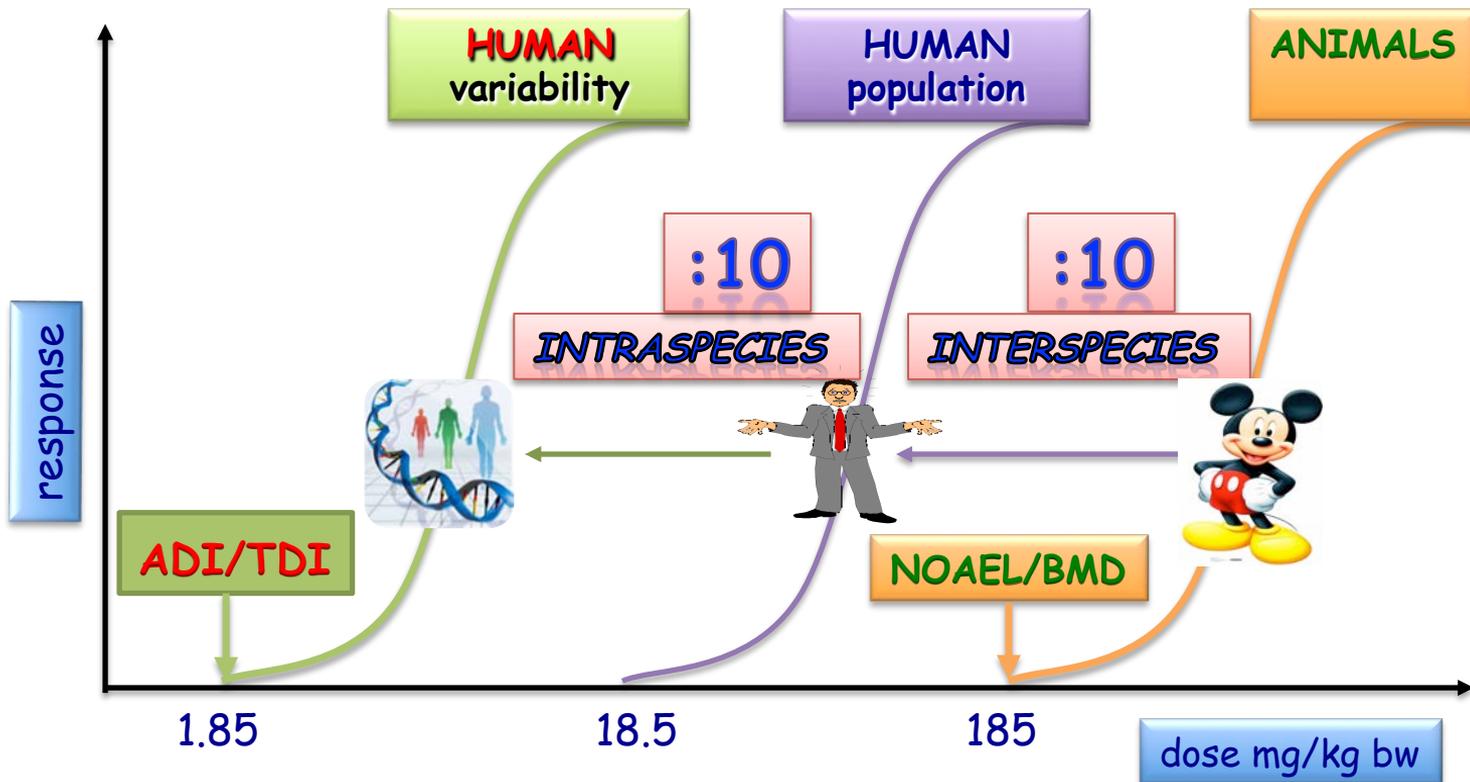


# HEALTH BASED GUIDANCES



# ANIMAL-BASED TOXICOLOGICAL STUDIES

(QUANTIFICATION OF ADVERSE HEALTH EFFECTS)



# ADI - TDI

(HEALTH BASED GUIDANCES)

## ADI - Admissible Daily Intake

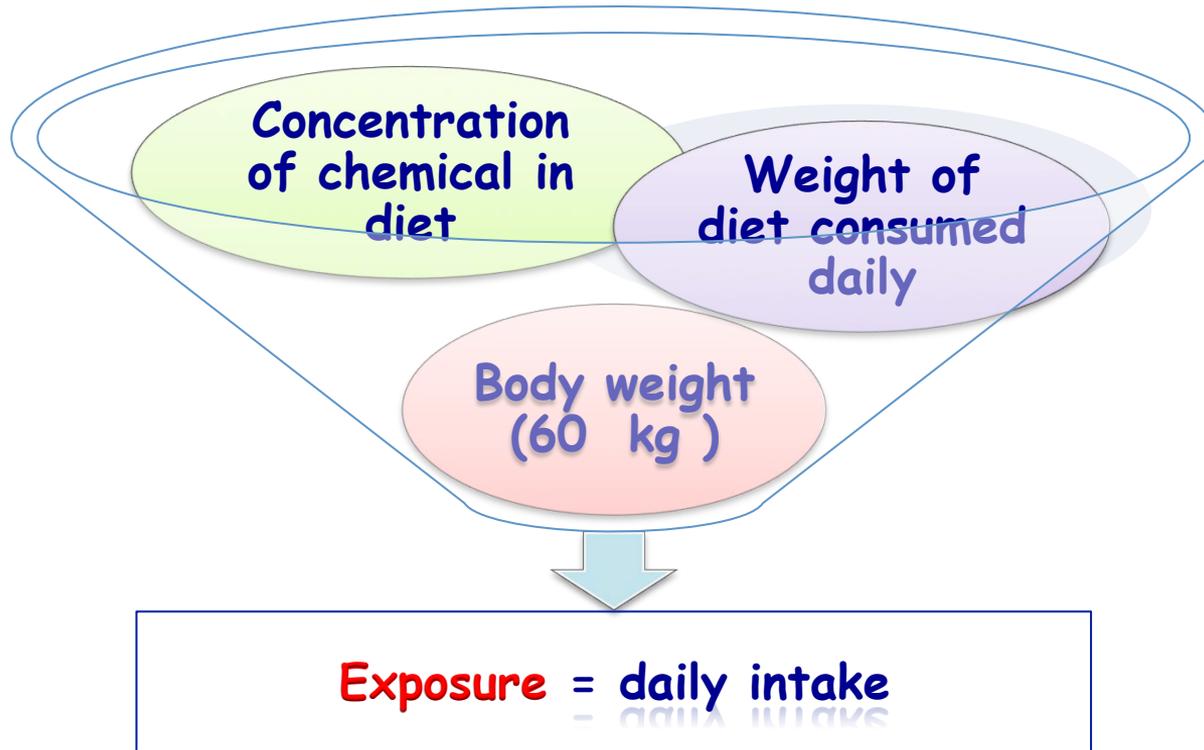
- ☑ represents the amount of a **food additive, a pesticide or a veterinary drug residue**, expressed on a body weight basis, that can be ingested daily **over whole lifetime** without appreciable health risk.



# RISK ANALYSIS



# EXPOSURE ASSESSMENT AND PUBLIC HEALTH



# VALORI GUIDA

VALUTAZIONE TOSSICOLOGICA

NOAEL acuto

Fattore di Sicurezza

ARfd

NOAEL cronico

Fattore di Sicurezza

ADI

VALUTAZIONE IN CAMPO

MRL



# CONSUMERS RISK ASSESSMENT



# RISK CHARACTERIZATION

## TMDI versus ADI

$$\sum \text{MRLs} = \text{TMDI}$$

$$\sum \text{MRLs} \ll \text{ADI}$$



# HIGHEST CALCULATED TMDI VALUES IN % OF ADI

CHRONIC RISK ASSESSMENT				
METRIBUZIN			No of diet exceeding ADI = 0.013 mg /kg bw	
Highest calculated TMDI values in % of ADI	MS Diet		Highest calculated TMDI values in % of ADI	Commodity / group of commodities
9.8	DE child		9.8	Pome fruit
5.2	NL child		5.2	Pome fruit
2.3	DK child		2.3	Pome fruit
2.2	FR toddler		2.2	Pome fruit
2.2	FR infant		2.2	Pome fruit
1.8	PL general population		1.8	Pome fruit
1.6	LT adult		1.6	Pome fruit
1.4	UK Toddler		1.4	Pome fruit
1.4	UK Infant		1.4	Pome fruit
1.3	ES child		1.3	Pome fruit
1.1	IE adult		1.1	Pome fruit
1.1	PT General population		1.1	Pome fruit
1.1	SE general population 90th percentile		1.1	Pome fruit
1.1	WHO Cluster diet B		1.1	Pome fruit
1.0	NL general		1.0	Pome fruit
1.0	IT kids/toddler		1.0	Pome fruit
0.9	ES adult		0.9	Pome fruit
0.8	IT adult		0.8	Pome fruit
0.8	WHO cluster diet E		0.8	Pome fruit
0.8	DK adult		0.8	Pome fruit
0.7	WHO regional European diet		0.7	Pome fruit
0.6	WHO Cluster diet F		0.6	Pome fruit
0.6	WHO cluster diet D		0.6	Pome fruit
0.5	UK vegetarian		0.5	Pome fruit
0.5	FR all population		0.5	Pome fruit
0.4	UK Adult		0.4	Pome fruit
0.3	FI adult		0.3	Pome fruit

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# HIGHEST CALCULATED TMDI VALUES IN % OF ADI

## CHRONIC RISK ASSESSMENT

METRIBUZIN		No of diet exceeding ADI = 0.013 mg /kg bw	
Highest calculated TMDI values in & % of ADI	MS Diet	Highest calculated TMDI values in % of ADI	Commodity / group of commodities
13.3	DE child	9.8	Pome fruit
8.3	NL child	5.2	Pome fruit
4.0	FR toddler	2.2	Pome fruit
3.2	UK Toddler	1.8	Citrus fruit
3.2	IE adult	2.1	Citrus fruit
3.1	ES child	1.8	Citrus fruit
3.0	FR infant	2.2	Pome fruit
2.5	DK child	2.3	Pome fruit
2.5	NL general	1.4	Citrus fruit
2.4	UK Infant	1.4	Pome fruit
2.3	WHO Cluster diet B	1.2	Citrus fruit
2.2	SE general population 90th percentile	1.1	Pome fruit
2.0	ES adult	1.1	Citrus fruit
1.9	PL general population	1.8	Pome fruit
1.7	PT General population	1.1	Pome fruit
1.6	LT adult	1.6	Pome fruit
1.5	IT kids/toddler	1.0	Pome fruit
1.5	WHO Cluster diet F	0.9	Citrus fruit
1.4	WHO cluster diet E	0.8	Pome fruit
1.3	UK vegetarian	0.8	Citrus fruit
1.3	WHO regional European diet	0.7	Pome fruit
1.2	IT adult	0.8	Pome fruit
1.2	FI adult	0.9	Citrus fruit
1.0	FR all population	0.5	Citrus fruit
1.0	DK adult	0.8	Pome fruit
0.9	WHO cluster diet D	0.6	Pome fruit
0.9	UK Adult	0.5	Citrus fruit

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ed  
AGRUMI



# HIGHEST CALCULATED TMDI VALUES IN % OF ADI

CHRONIC RISK ASSESSMENT			
METRIBUZIN			
No of diet exceeding ADI = 0.013 mg /kg bw			
Highest calculated TMDI values in % of ADI	MS Diet	Highest calculated TMDI values in % of ADI	Commodity / group of commodities
0.00000.....	DE child	0.00000.....	Coriander seed

SEMI di  
CORIANDOLO



# HIGHEST CALCULATED TMDI VALUES IN % OF ADI

CHRONIC RISK ASSESSMENT			
Pendimethalin		No of diet exceeding ADI = 0.125 mg /kg bw	
Highest calculated TMDI values in % of ADI	MS Diet	Highest calculated TMDI values in % of ADI	Commodity / group of commodities
0.0	ES child	0.0	Lentils
0.0	IE adult	0.0	Lentils
0.0	ES adult	0.0	Lentils
0.0	WHO Cluster diet B	0.0	Lentils
0.0	UK vegetarian	0.0	Lentils
0.0	WHO regional European diet	0.0	Lentils
0.0	IT kids/toddler	0.0	Lentils
0.0	WHO cluster diet D	0.0	Lentils
0.0	DE child	0.0	Lentils (fresh)
0.0	IT adult	0.0	Lentils
0.0	UK Toddler	0.0	Lentils
0.0	WHO cluster diet E	0.0	Lentils
0.0	UK Adult	0.0	Lentils
0.0	NL child	0.0	Lentils
0.0	WHO Cluster diet F	0.0	Lentils
0.0	NL general	0.0	Lentils

SEMI di LENTICCHIE



# THOUGHT TO TAKE HOME

*..... no exposure*

*..... no risk !!!*



# THANK YOU

## TOXICOLOGY LABORATORY



U  
F  
E

onimento della flora infestante.