DERIVATION OF FOOD SAFETY STANDARDS

[I]

ACTION LEVEL

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ACTION LEVEL

US Food And Drug Administration (US-FDA)

ACTION LEVELS are established based on the UNAVOIDABILITY of poisonous or deleterious substances and DO NOT represent permissible levels of contamination where it is avoidable

ACTION LEVEL represents limit at or above which FDA will take legal action to remove product from market

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The blending of food or feed containing a substance in excess of an action level with another food or feed is not permitted, and the final product resulting from blending is unlawful, regardless of the level of contaminant

DILUTION DOES NOT WORK!

Where no established action level exists, FDA may take legal action against the product at the minimal detectable level of the contaminant

For a detailed list, see US-FDA,
Industry Activities Staff Booklet,
March 1998 (www.fda.gov)

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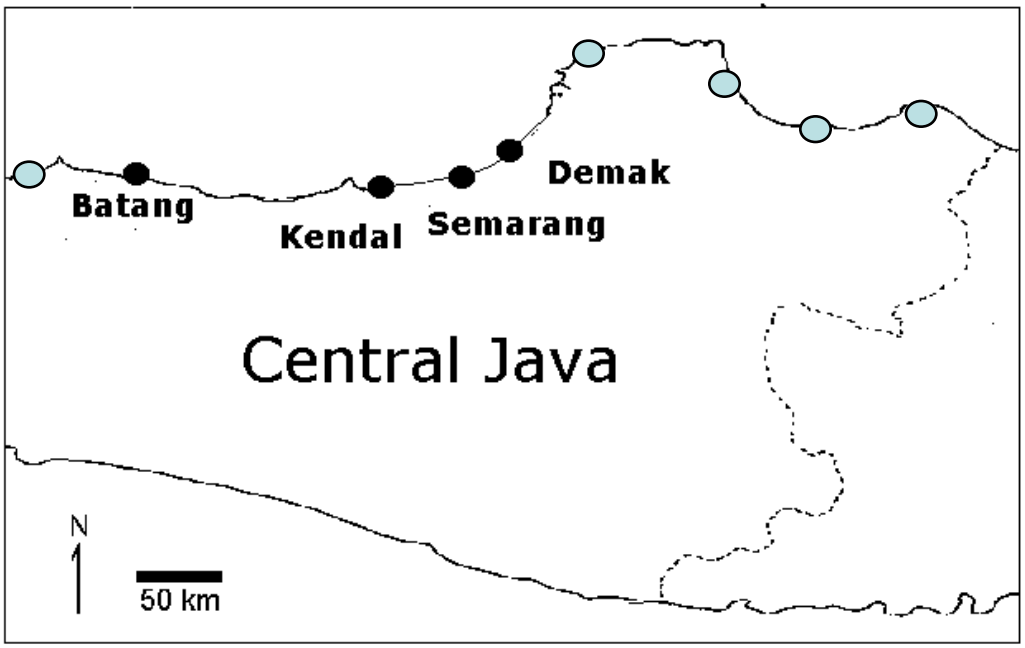
HOW TO DERIVE ACTION LEVEL (1)

Sampling of subjective foodstuff across the geographical boundary SPATIAL DISTRIBUTION ENCOMPASING ALL LEVELS OF CONTAMINATION

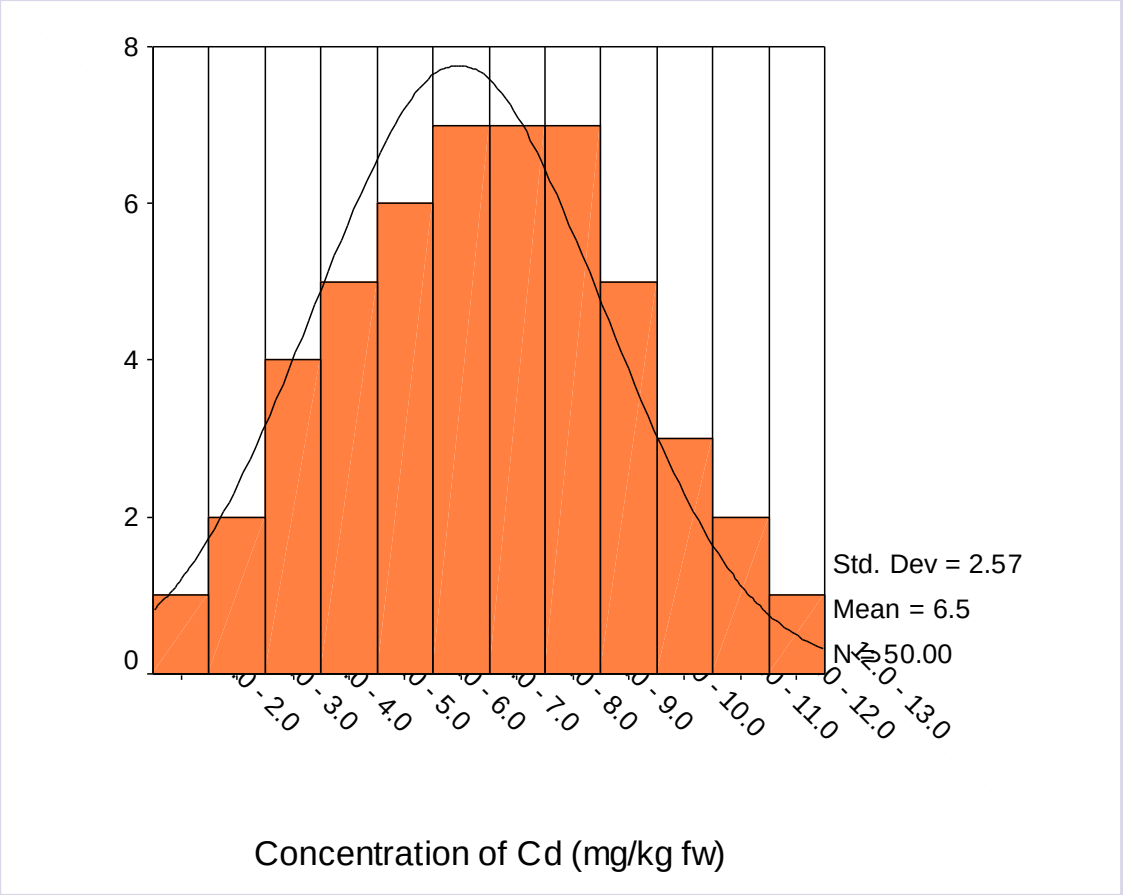


HOW TO DERIVE ACTION LEVEL (2)

Determination of concentrations of toxicant or contaminant in the sample of foodstuff

HOW TO DERIVE ACTION LEVEL (3)

Set-up a distribution based on values (data) of contaminant concentration



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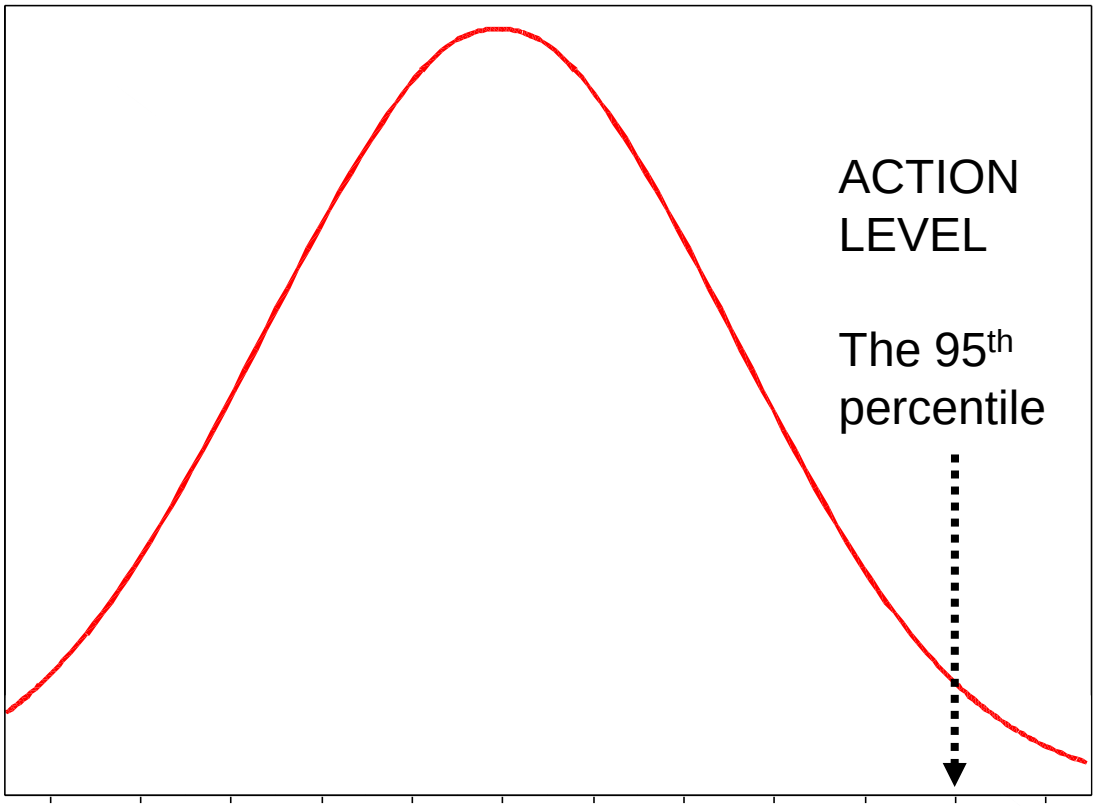
HOW TO DERIVE ACTION LEVEL (4)

Identify the safety limit based on the Xth percentile (the 90th or 95th percentile) of the distribution



Distribution of Concentrations of Cd

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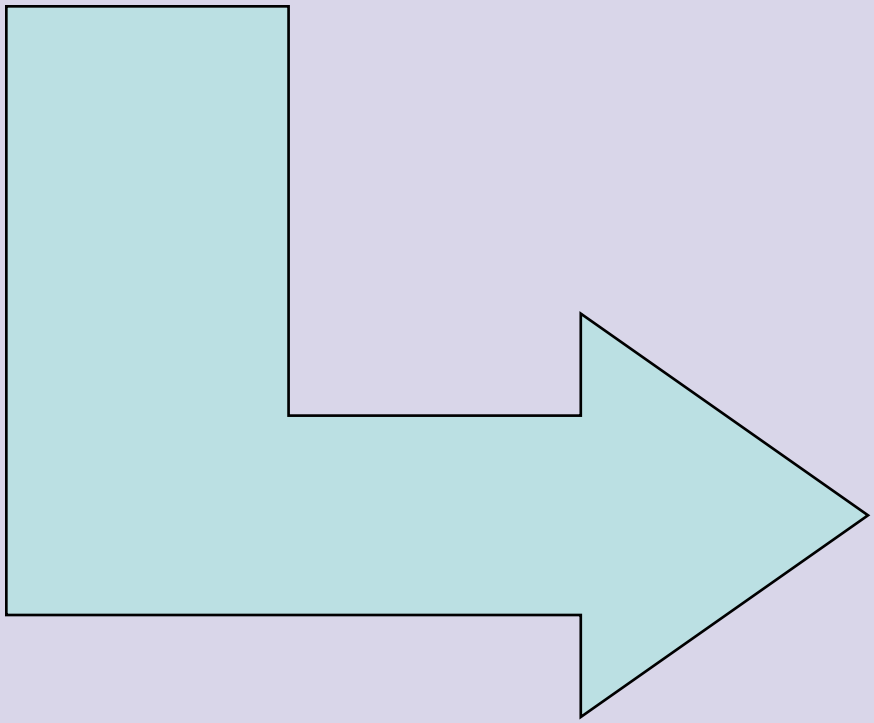
APPLICATION



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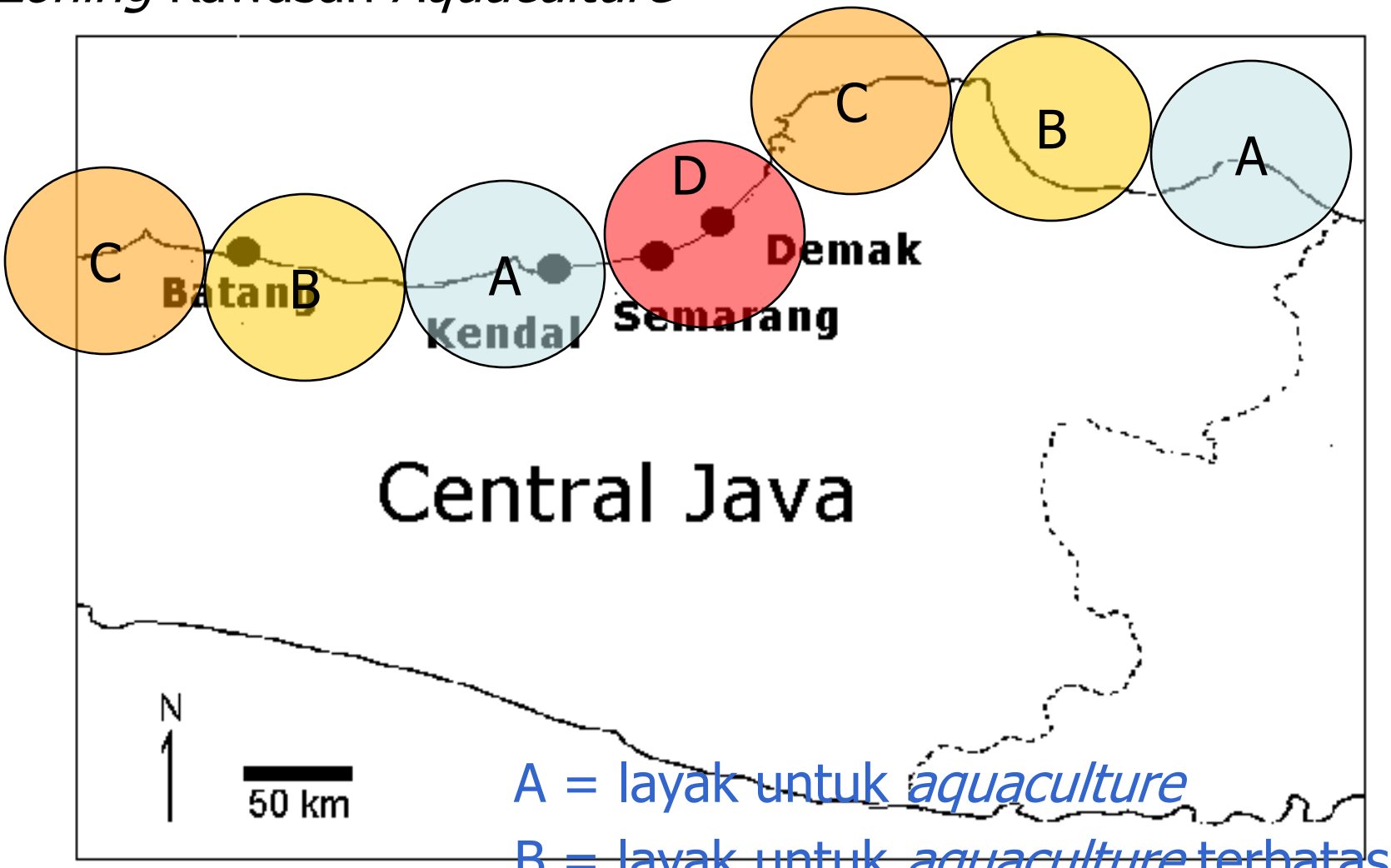
Zoning Kawasan *Aquaculture*



A = layak untuk *aquaculture*

B = layak untuk *aquaculture* terbatas

C = tidak layak untuk *aquaculture*

D = sangat tidak layak untuk *aquaculture*

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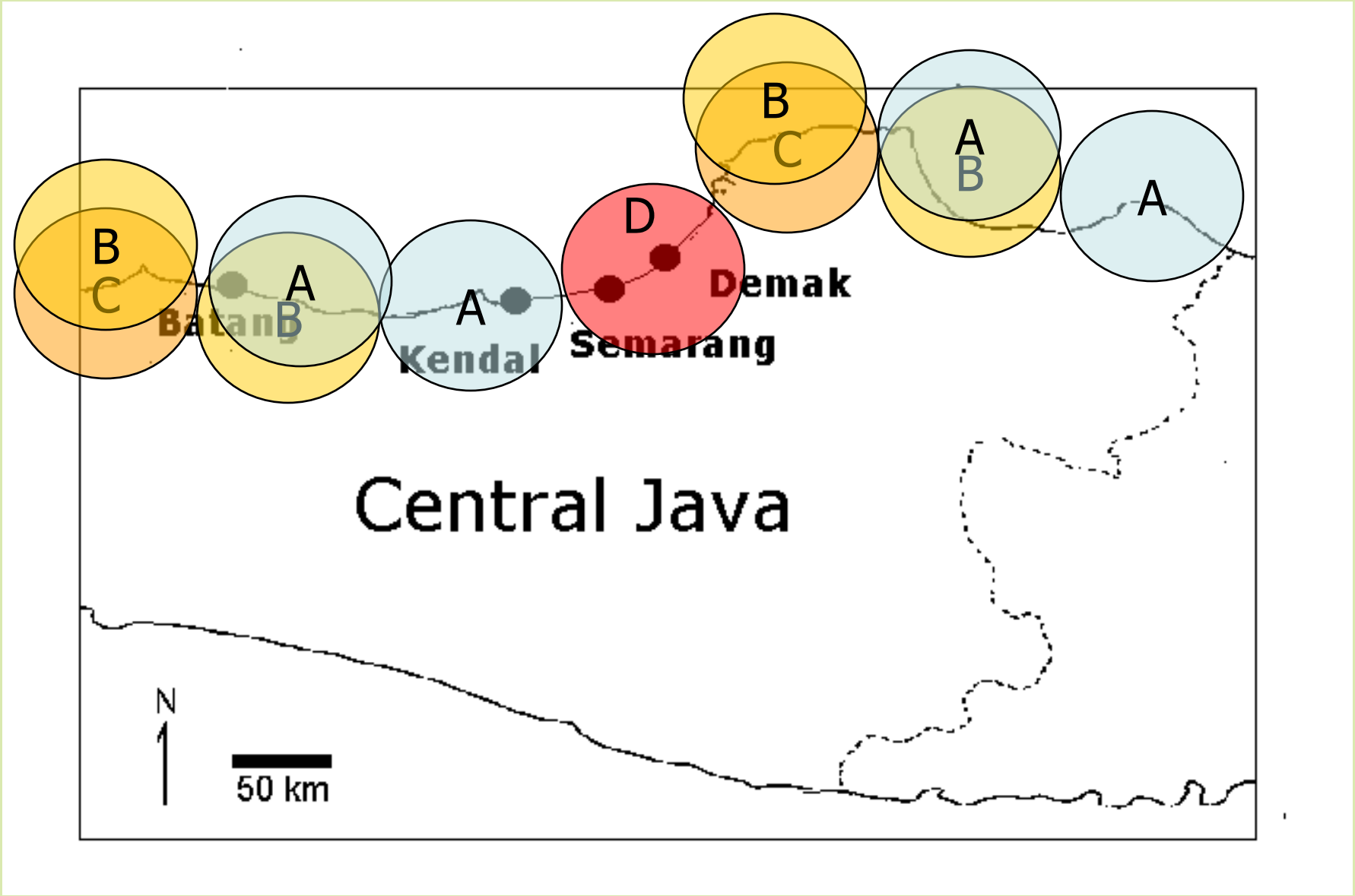

Zoning Kawasan *Aquaculture*

Untitled - SPSS Data Editor

File Edit View Data Transform Analyze Graphs Utilities Window Help

5 :

	location	cd	var	var	var	va
1	1	2.00				
2	2	2.10				
3	3	2.10				
4	4	2.20				
5	5	2.20				
6	6	2.20				
7	7	2.30				
8	8	2.30				
9	9	2.30				
10	10	2.30				
11	11	2.40				
12	12	2.40				
13	13	2.40				
14	14	2.40				
15	15	2.40				
16	16	2.50				
17	17	2.50				
18	18	2.50				
19	19	2.50				
20	20	2.50				
21	21	2.50				
22	22	2.60				
23	23	2.60				
24	24	2.60				
25	25	2.60				
26	26	2.60				
27	27	2.70				
28	28	2.70				
29	29	2.70				
30	30	2.70				

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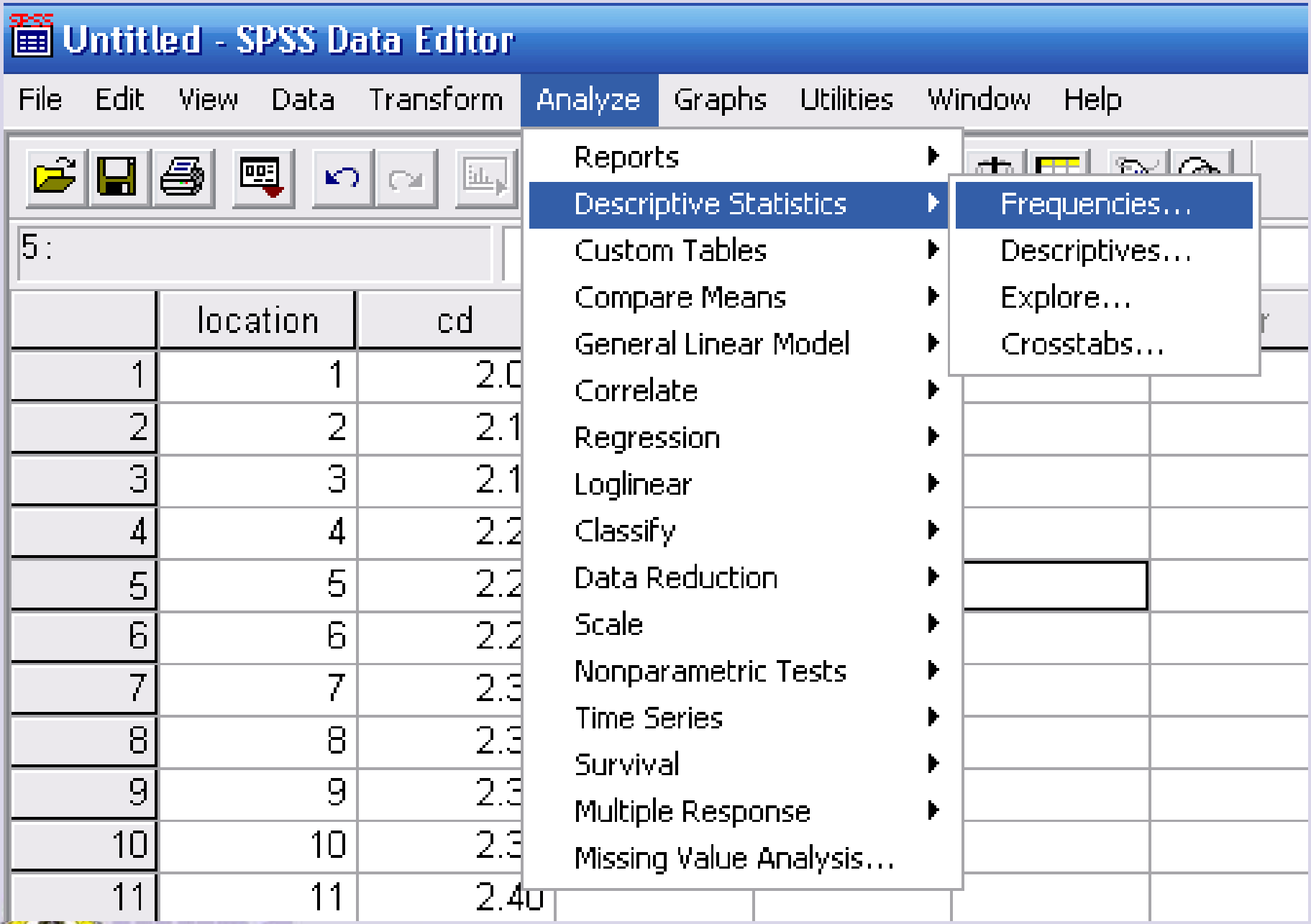

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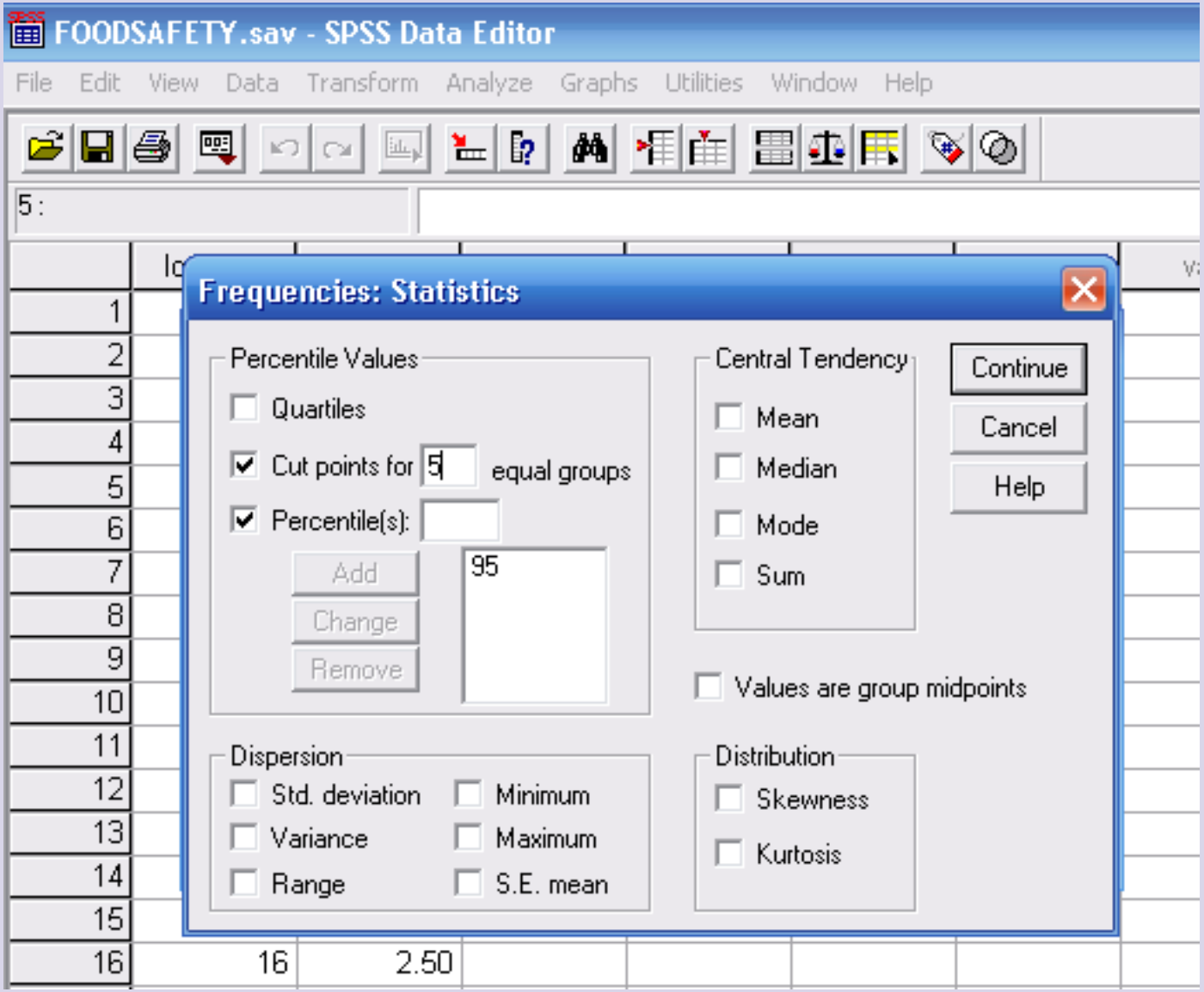

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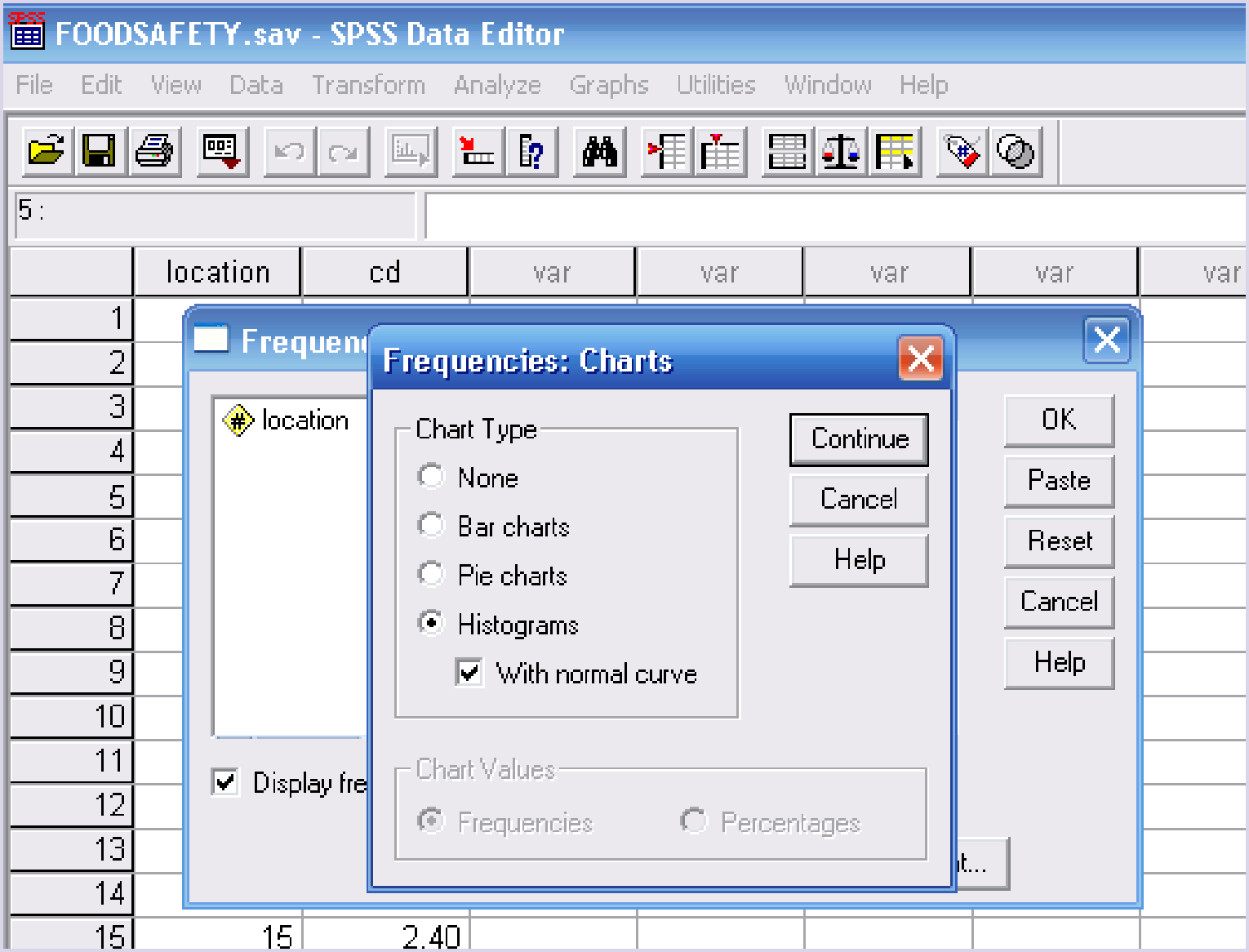

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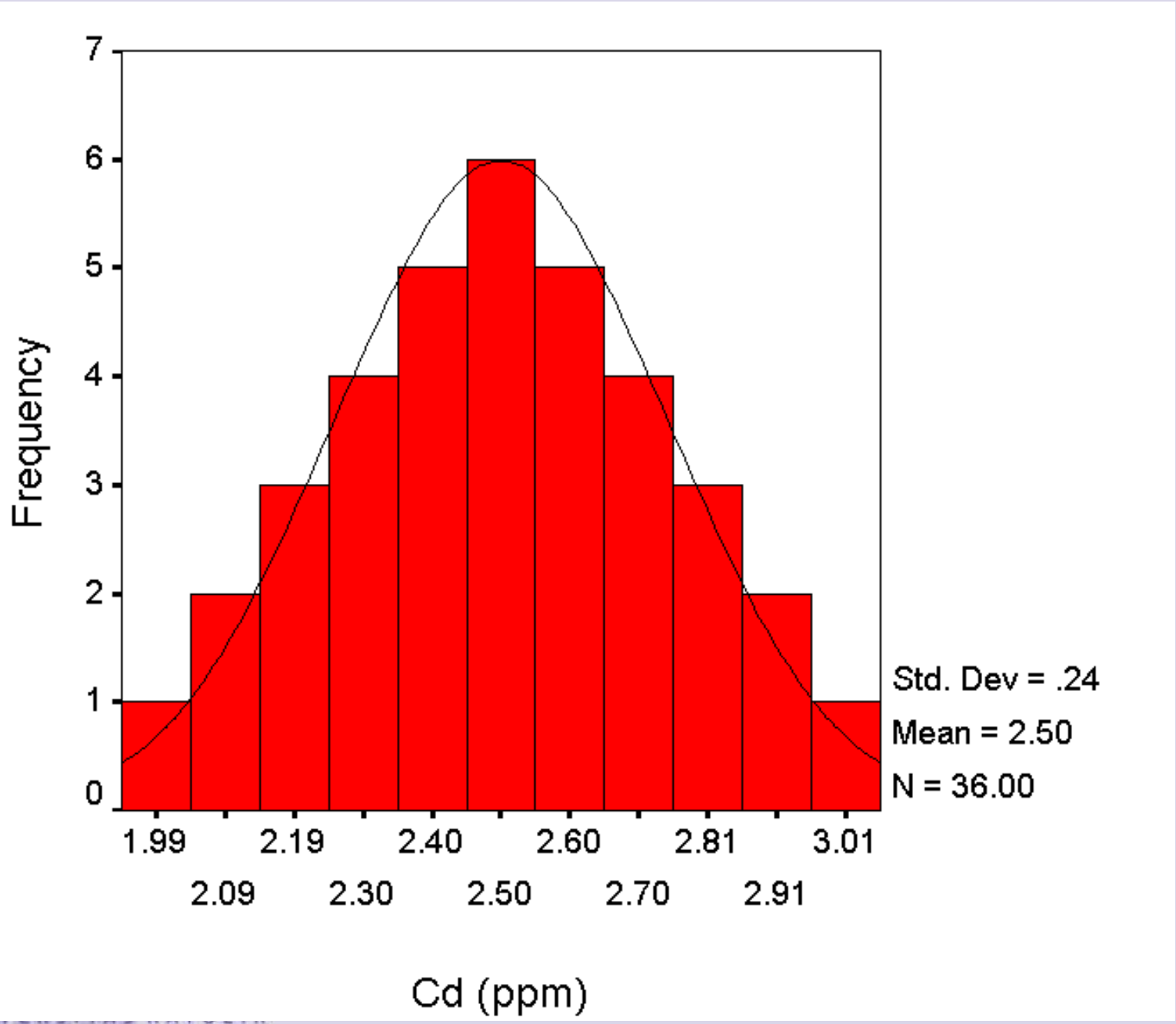

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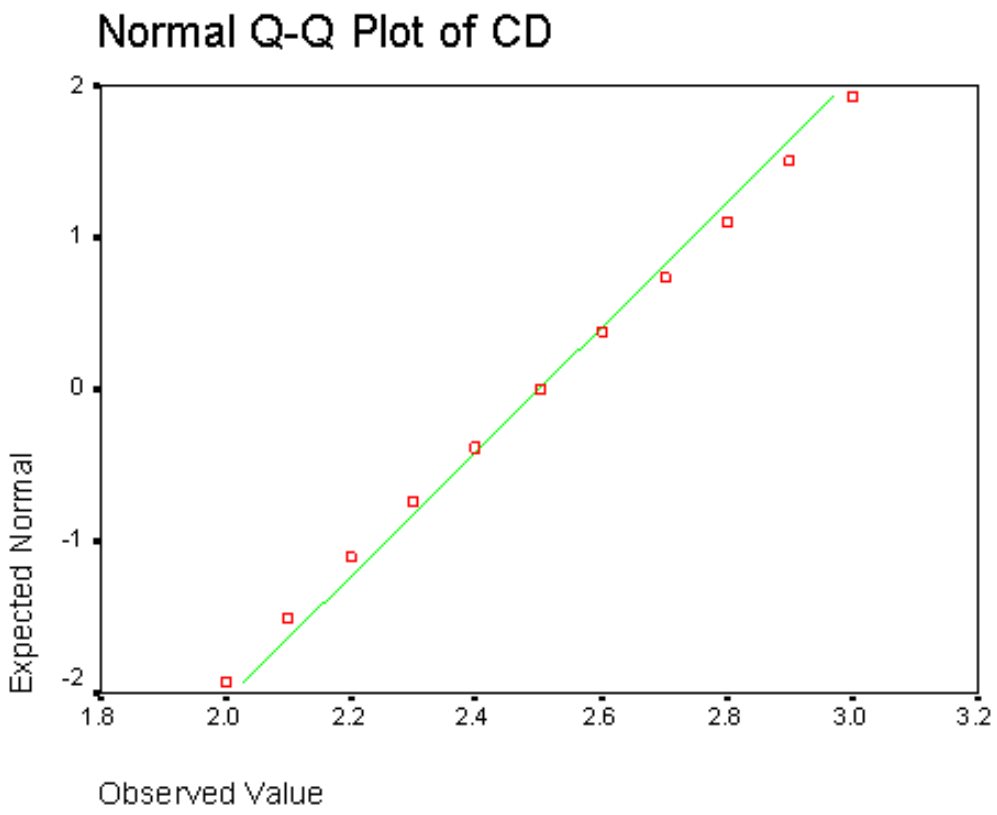
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CD	.083	36	.200*	.977	36	.705

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

CD



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Descriptives

			Statistic	Std. Error
CD	Mean		2.5000	4.082E-02
	95% Confidence Interval for Mean	Lower Bound	2.4171	
		Upper Bound	2.5829	
	5% Trimmed Mean		2.5000	
	Median		2.5000	
	Variance		6.000E-02	
	Std. Deviation		.2449	
	Minimum		2.00	
	Maximum		3.00	
	Range		1.00	
	Interquartile Range		.4000	
	Skewness		.000	.393
	Kurtosis		-.545	.768

Percentiles

		Percentiles						
		5	10	25	50	75	90	95
Weighted Average(Definition 1)	CD	2.0850	2.1700	2.3000	2.5000	2.7000	2.8300	2.9150
Tukey's Hinges	CD			2.3000	2.5000	2.7000		

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[2]

MAXIMUM RESIDUE LIMIT (MRL)

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MAXIMUM RESIDUE LIMIT
(FAO, WHO, ASEAN, Badan POM etc)

UNIT

mg toxic substance per kg food item

CALCULATION

- **Acceptable Daily Intake (ADI) of the toxic substance**

- **Consumption of selected food item**

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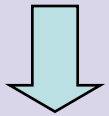
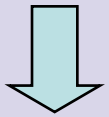
NOAEL/NEL/NOEC

Toxicological Database: results of toxicity tests (human or other mammals)



Application of a safety factor – usually 100 (a “quick and dirty” method)



Acceptable Daily Intake (ADI) or Reference Dose (RfD)

NOAEL = no observed adverse effect level
NEL = no effect level
NOEC = no observed effect level

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EXAMPLE:
Estimation of MRL of toxic substance "X" in rice

- **ADI of toxic substance "X" = 10 mg/kg bw**
- **Daily Consumption of rice = 100 g**
  (~ 20% of total food intake)
- **Reference body weight = 60 kg**
- **Total permissible daily intake of "X" = 60x10 mg = 600 mg**
- **Total permissible daily intake**
  of "x" via rice consumption = 20% x 600 mg = 120 mg
- **MRL = 120 mg/100 g = 1.2 g/kg rice**

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EXAMPLE:

- MRL (Cd) = 1.20 mg/kg rice
- Cd concentration in rice = 0.1 mg/kg
- Body weight of the person = 70 kg
- Rice comprises ± 20% of the total food intake of the person
- What is maximum permissible daily consumption of rice?

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Part 6. Food Safety in Retail Foods

26. Commercial Food Service Establishments: The Principles of Modern Food Hygiene 455
27. Institutional Food Service Operations 523
28. Food Service at Temporary Events and Casual Public Gatherings 549

Part 7. Diet, Health, and Food Safety

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30. Food Fortification 607
31. Sports Nutrition 627
32. Dietary Supplements 641
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Part 5. Food Safety Operations in Food Processing, Handling, and Distribution

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22. Food Safety Control Systems in Food Processing 403
23. Food Safety and Innovative Food Packaging 411
24. Safe Handling of Fresh-Cut Produce and Salads 425
25. Good Manufacturing Practices: Prerequisites for Food Safety 443

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PowerPoint Presentations

Kelas B

FOOD FORTIFICATION

MEDICAL FOOD

INNOVATIVE FOOD PACKAGING

INSTITUTIONAL FOOD SERVICE

Kelas A

DIETARY SUPPLEMENT

HANDLING OF FRESH CUT PRODUCE

FOOD SAFETY COPNTROL SYSTEM

INNOVATIVE PACKAGING

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