RBIS chart
nstructions.doc (3..

(View last) PBIS
Risk Triangle...

Presentation1.ppt
(501 KB)

To: RBIS Development committee.

I had the privilege of participating in the two day RBIS Public workshop net meeting October 2006 at the Madison, Wisconsin District Office.
I was motivated by the discussion of converting qualitative data into quantitative data and graphing it to illustrate it in a way that would rank establishment risk by using a number of factors.

By using Expert Elicitation, establishment risk control, establishment volumes risk, percentages of total NRs, microbial results, and percentages of NRs (that I evaluated as being significant), I created a excel program I call the "RBIS Risk Triangles".

I used an excel spread sheet to calculate data and made charts to illustrate the results in a way that can be modified if needed, and could be used as part of the existing PBIS Plant Profile and Procedures results. The data is automatically calculated on the charts to show an establishment's risk level.

Please view the Power Point Presentation and the excel program for consideration for use in the Risk Base Inspection System.

Daniel Jozefowski
USDA FSIS CSI (Relief Inspector)
Madison, Wisconsin.

I am interested in constructive feedback and comments. Thank You.
dan.jozefowski@fsis.usda.gov
djozefowski@sbcglobal.net

Daniel Jozefowski
Relief CSI
Madison District

Instructions:

The first page shows the variables used to identify risk and the risk triangles. By paging down you will see the conversion of Expert Elicitation to a numerical value. ==Page down.==

When looking at the excel sheet find the yellow ==shaded areas== and locate the numerical values in them.

These values hypothetically represent the data collected by the in-plant inspector.
By changing the values only in the yellow cells an automatic calculation will occur and the pie chart will adjust to those values. The higher the risk the more red appears.

- Find the Performed task (yellow cell) and enter the number of task performed during a given period of time.

- Find the establishment risk control cell and enter the value.

- Find the expert elicitation cell and enter the conversion value

- Find the EVR cell and enter the value.

- Find the # of total NRs section and enter a value in any selected cell

- Find the # of significant NR section and enter a value that represents any of the total NRs.

Note: When entering the number of NRs in the total NR cells always enter how many are significant into the appropriate significant cells. The significant NRs are an example of what could be incorporated into the procedure schedule results as a drop down window. Then it can be automatically tracked in the system.
The number of total NRs will be the same or greater than the significant NRs.

- The Establishment Risk Level chart values change on the control chart when entries are made in the yellow shaded establishment risk control cell and the expert elicitation cell and the establishment volume risk cell.
- After the above is completed, observe the summary section ==(green cells).== This section illustrates the values of the expert elicitation, establishment volume risk, establishment risk control, % Sig. NRs, microbial volume risk.

Note: The MVR value is used for ranking Est. risk when multiple Est. in an assignment or area encounters a positive. Conversely, the higher the number the more at risk an establishment is. This is used only after finding the Establishments Risk Level

- The first chart you see (Value control chart) is a summary of the data provided in the yellow cells. Find the value from the value control data and find the appropriate EVR ERL chart and take note of its position. As an exercise find the

Est. risk level for several Est.scenarios and highlight the cells in the (**Establishments Risk Level Chart**) for each in a different color. Then view the charts at 25% (zoom in). The numerical figures won't be legible but the colored cells will be. This shows who is at a higher or lower risk in a different way.

- A pie chart using accumulated data illustrating risk levels has been put into the excel sheet. Performed task + # NRs + %NRs + % significant NRs + Risk Triangle
- The pie graph automatically changes with entries entered into the yellow shades areas of the excel sheet except the EVR The higher the risk the more red appears on the chart.

- An entry in the positive cell of the excel sheet will adjust the graph to solid red.

RISK BASED INSPECTION SYSTEM

Identifying Risk Levels
With Risk Triangles

Triangles Identifying Risk

RT   **Risk Triangle**   =   ERC + % sig. NRs + EE

ERL **Establishment Risk Level**   =   SQRT of RT : VR + EVR +% sig. NRs

MVR **Micro Volume Risk**   =   MCP X (EVR + ERC)
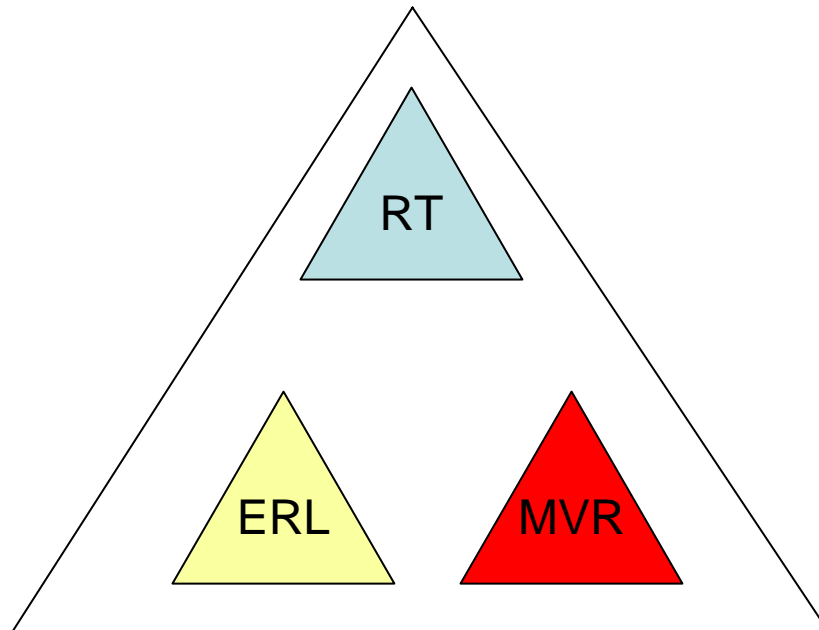
****Variables to identify RISK****

EE	Expert Elicitation			
ERC	Establishment Risk Control	1	2	3
ERL	Establishment Risk Level	SQRT of RT : VR + EVR +% sig. NRs.		
EVR	Establishment volume risk	1	1.5	2
MCP	Micro Positive	# of positive results		
MVR	Micro Volume Risk	MCP X (EVR + ERC)		
RT	Risk Triangle	ERC + % sig.NRs + EE		
RT:VR	Risk Triangle: Volume Risk	RT X EVR		

RISK LEVEL DATA

% NRs	0	1	2	3	4	5	6	7	8	9	>>
Establishment Volume Risk	1 Very small	-	-	-	-	1.5 small	-	-	-	-	2 large
Establishment Risk Control	1	-	-	-	-	2	-	-	-	-	3
Expert Elicitation	1.1	-	-	-	-	-	-	-	-	-	23.1
Microbiological results	#	P	o	s	i	t	i	v	e	s	*
% NRs	0	1	2	3	4	5	6	7	8	9	>>
% significant NRs	0	1	2	3	4	5	6	7	8	9	>>
# procedures performed	0	-	1	-	10	-	100	-	1000	-	>>

Expert Elicitation

Expert Elicitation Conversion

I took experts ranking of product risk and the medium scores and converted it to a numerical value.

Example: Expert Elicitation of product risk 23 and a median score of 10, converted to.

23 .1

Calculating Risk Levels using an excel sheet

- The risk level data is to be entered into a programmed excel sheet
- When looking at the excel sheet find the yellow shaded areas and locate the numerical values in them.
- These values hypothetically represent the data collected by the in-plant inspector.
- By changing the values only in the yellow cells an automatic calculation will occur.
- example only, see excel sheet

									EE	23.1		
# of procedures performed						Summary section			EVR	1		
		1500							ERC	1		
									MVR	1.00		
EVR			ERC				EE					
1			1				23.1					

example
Total NRs   % sig. NRs

	Monitoring	Records	C/A	Implement	Product adult	Insanitary conditions	Failed C/A	Preclude Insp.	Linked NRs
HACCP	4				2				
SSOP	25				3	22			
				SPS		6			
				Security				Positive	0

Summary Section

Example of summary section found on excel sheet

The summary section of the excel sheet has values needed to read the charts. The MVR value is not used for reading the charts. This will be explained later

Using the example to the right, it shows the values needed to use the correct chart

Chart::   example

ERC 1
                E
                R
                V
                1

.

EE	1.1			
EVR	1			
ERC	1			
% sig NRs	1			
MVR	2	MCP	EVR	ERC
		0	1	1

A chart was developed to auto calculate the risk variable information. This is called the value control chart.
These values are auto calculated when entering data into the yellow shaded cells of the excel sheet.
The est risk value can also be seen in the section above the summary section. See excel sheet.
It is used to initially identify the establishment risk level # by using the number of significant NRs and the product risk value derived from expert elicitation and median scores.
A master chart has been made to show the ranking positions.

example	0	1	3	-	% sig.NRS	-	-	8	9	10
23.1	4.91	5.11	5.3	-	-	-	-	6.33	6.49	6.64
	#	#	#	#	#	#	#	#	#	#
	#	#	#	#	#	#	#	#	#	#
1.1	1.45	2.02	2.47	-	-	-	-	4.25	4.48	4.7

Master Chart

Nine other charts were made to show an Establishments Risk Level positions.
This is based on the risk level data.
Each chart has values in them to reference the position of the risk level value from the value control chart.

• ERC 1 EVR 2	ERC 2 EVR 2	ERC 3 EVR 2
• ERC 1 EVR 1.5	ERC 2 EVR 1.5	ERC 3 EVR 1.5
• ERC 1 EVR 1	ERC 2 EVR 1	ERC 3 EVR 1

Chart Example:

%NRs   ERL #s

ERC 1

E
V
R
1

Locate the excel charts and find the
EE column and then find the
# of sig. NRs row at the top
and cross reference them.
This will give the
Establishments Risk Level

EE

	0	1	2	3	4
23.1	4.91	5.11	5.30	→	→
1.1	1.45	2.02	2.47	→	→

A pie chart using accumulated data illustrating risk levels has been put into the excel sheet.

- Performed task + # NRs + %NRs + % significant NRs + Risk Triangle
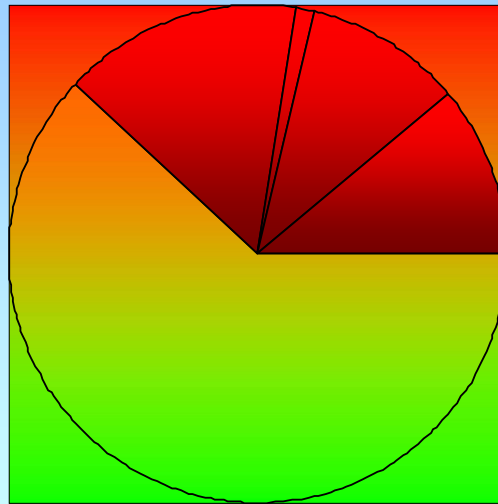
The pie chart using accumulated data illustrating risk levels
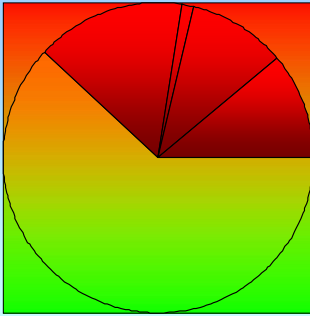
The chart show the higher the risk the more red appears.

The pie graph automatically changes with entries entered into the yellow shades areas of the excel sheet except the EVR
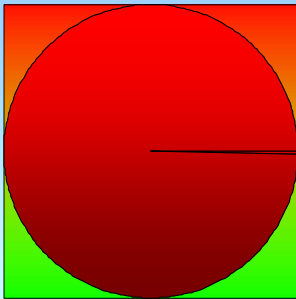
The EVR is calculated in the risk level shaded green of the excel sheet and is used in the establishment risk level chart latter.

note: An entry in the positive cell of the excel sheet will adjust the graph to solid red to illustrate that a potential problem may have occurred.

MVR

Microbial Volume Risk

When a positive occurs the pie chart will be completely red. A value will be calculated in the MVR cell of the summary section. Adjacent to the MVR # are three cells shaded light green. These are the values used to calculate the number that represents the MVR #. The higher the number the greater at risk is the establishment. Not to be considered if a positive has not occurred. The MVR value is used for ranking Est. risk when multiple Est. in an assignment encounter a positive.

MVR	# Pos	EVR	ERC	MVR	#Pos	EVR	ERC
3	1	1	1	4	2	1	1
4	1	1	2	5	2	1	2
5	1	1	3	6	2	1	3
3.5	1	1.5	1	4.5	2	1.5	1
4.5	1	1.5	2	5.5	2	1.5	2
5.5	1	1.5	3	6.5	2	1.5	3
4	1	2	1	5	2	2	1
5	1	2	2	6	2	2	2
6	1	2	3	7	2	2	3

RBIS

Risk Triangles

Acronyms

EE	Expert Elicitation				
ERC	Establishment Risk Control	1	2	3	
ERL	Establishment Risk Level	(ERC x RT x EVR x % sig. NRs)			
EVR	Establishment volume risk	1	1.5	2	
MCP	Micro Positive	# of positive results			
MVR	Micro Volume Risk	MCP x (EVR x ERC)			
RT	Risk Triangle	ERC x % sig NRs x EE			
RTVR	Risk Triangle Volume Risk	RT x EVR			

Triangles: RT, ERC, EE, ERL, MVR

Expert Elicitation
Product Risk & Median Scores

Conversion Value	Median score	
0	1	RTS meat fully cooked without subsequent exposure to the environment
0.1	1	RTS poultry fully cooked without subsequent exposure to the environment
0.2	2	RTS salt-cured meat
0.3	2	RTS salt-cured meat
0.2	2	RTS dried meat
0.3	3	RTS dried poultry
0.7	2	RTS salt/fermented meat (without cooking)
0.2	2	RTS acid/fermented poultry (without cooking)
0.3	4	RTS intact pork
9	3	RTS fully cooked meat
11	4	Raw intact beef
12	3	RTS fully cooked poultry
13	5	Raw intact meat other than beef or pork
14	7	Raw or otherwise processed meats
15	7	Raw or otherwise processed poultry
16	8	Raw Grnd., comminuted, or otherwise non-intact pork
17	8	Raw intact poultry other than chicken or turkey
18	9.7	Raw Grnd., comminuted, or otherwise non-intact meat other than beef or pork
19	8	Raw intact chicken
20	9	Raw intact turkey
21	10	Raw Grnd., comminuted, or otherwise non-intact beef
22	10	Raw Grnd., comminuted, or otherwise non-intact poultry-other than chicken or turkey
23	10	Raw Grnd., comminuted, or otherwise non-intact chicken
23	10	Raw Grnd., comminuted, or otherwise non-intact turkey

Calculations were based on 100 performed tests initially to facilitate ease of developing and monitoring percentages.
When entering the number of NRs in the total NR area always enter how many are significant into the appropriate significant area.
The number of /sat NRs will be the same or greater than the significant NRs.

The pie chart automatically changes with entries entered into the yellow shaded areas except the EVR.
The EVR is calculated in the risk level shaded green.
note: An entry in the positive cell will adjust the pie chart to solid red. The MVR value is used for ranking Est. risk when multiple Est. in an assignment encounter a positive

Other entries will adjust the pie chart to decrease or increase the red shaded area

Enter values in yellow shaded areas only

Establishment Risk Level Charts

	0	1	2	3	4	5	6	7	8	9	10
ERC 1 EVR 2											
ERC 2 EVR 2											
ERC 3 EVR 2											
ERC 1 EVR 1.5											
ERC 2 EVR 1.5											
ERC 3 EVR 1.5											
ERC 1 EVR 1											
ERC 2 EVR 1											
ERC 3 EVR 1											

RBIS
RISK TRIANGLES