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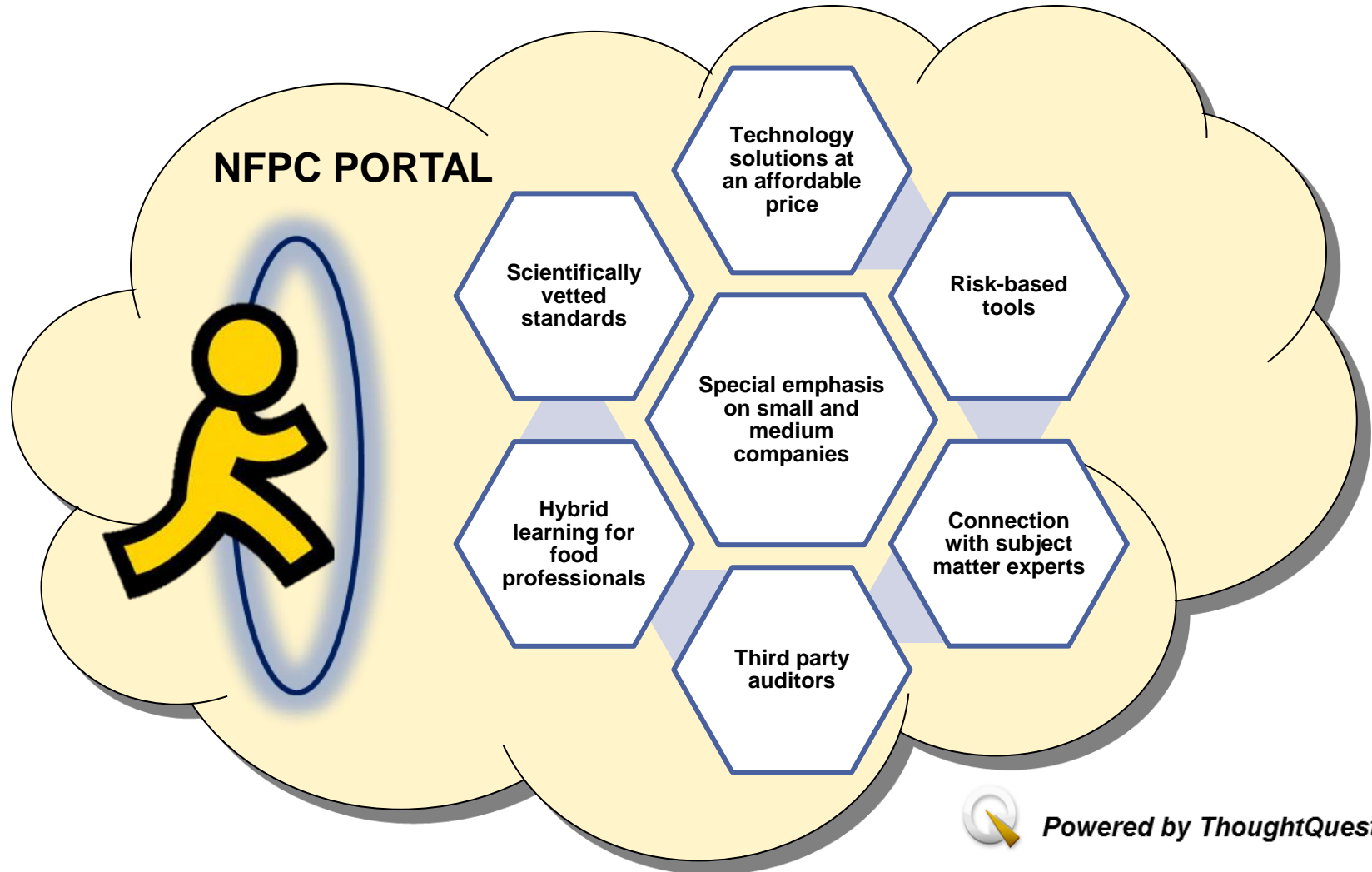
# **FDA BRIEFING BOOK: FOOD DEFENSE™**

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# SUMMARY

ThoughtQuest has developed a suite of patented science and risk-based tools known as Food ProtectionTQ™ (with TQ standing for threat quotient)	Address assessment, prevention and response
	Look at all-hazards events
	Science and risk-based
One of the tools is called Food DefenseTQ™ that looks at:	Food defense incidents
	Fires and arson
	Equipment failure
	Industrial accidents
	Natural disasters
Designed to support Carver + SHOCK	Uses quantitative risk values
	Computer intensive analytics
	All data is scientifically and independently vetted
We are now establishing the National Food Protection Collaboratory™ (NFPC) web-based portal to make the new technology available to small and medium sized food business	A community of interest for small and medium businesses around affordable easy to use technology solutions
	Science and risk-based vetted tools
	Low cost consulting to establish food defense plans
	Programs of food defense education

# THE NATIONAL FOOD PROTECTION COLLABORATORY™ (NFPC) PORTAL

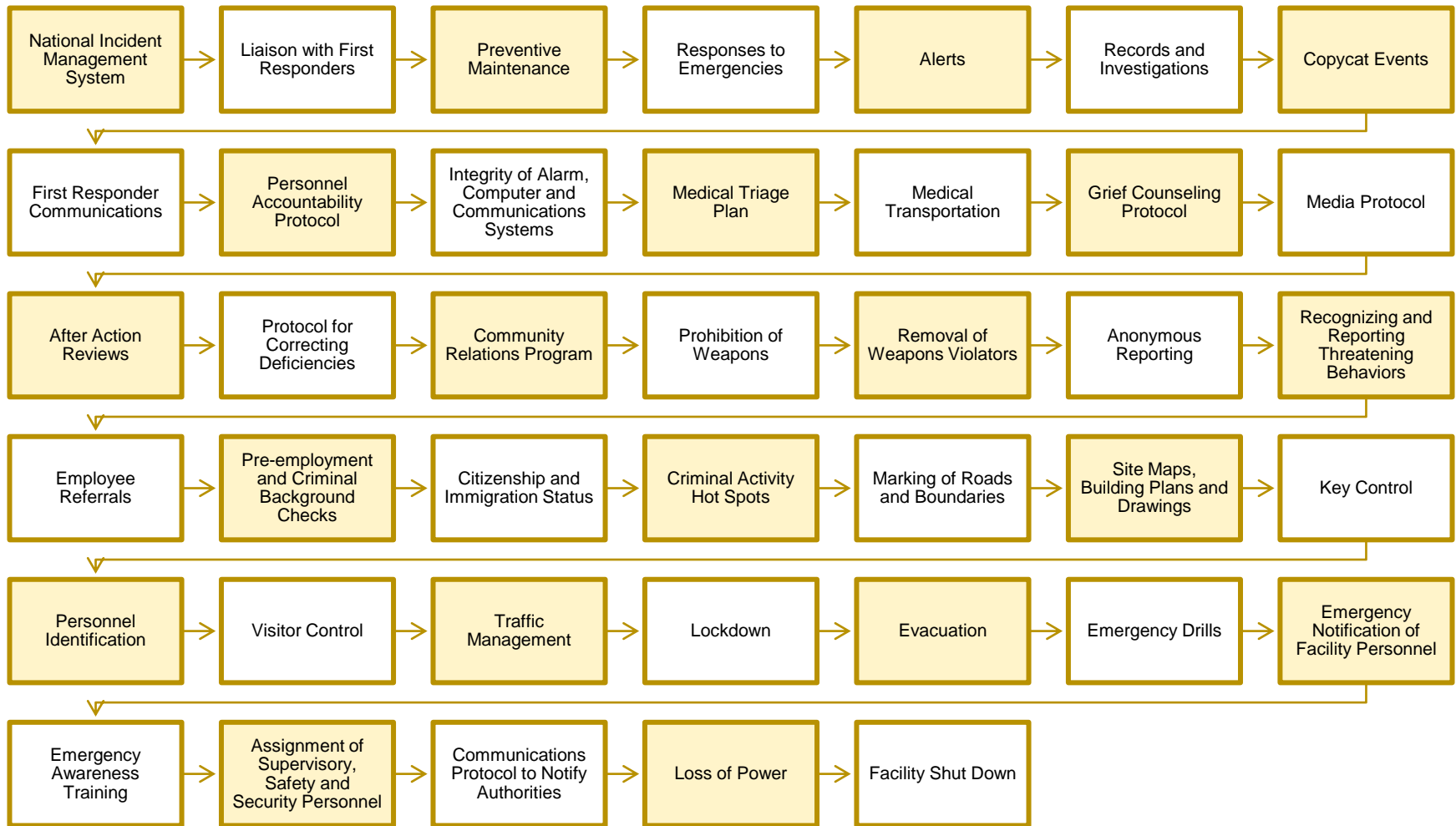


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# ONE OF SIX TOOLS THAT COMPRISE FOOD PROTECTIONTQ™

FPTQ Tool	Capability	
POISON™	Repository of all hazards events affecting the food supply chain. By studying these past events:	Tells you what worked and what didn't work;
		Helps you figure out the best things to do when confronted with a similar situation, and;
		Helps identify the early warning signals to prevent bad things before they happen.
Food Mapper™	Powerful search engine of regulations and best practices that tells you:	Who's responsible for what;
		What you must comply with, and;
		The best industry practices.
Food SafetyTQ™ and <i>Food DefenseTQ™</i>	<i>Real time assessment of all aspects of plant operations including food safety and defense to:</i>	<i>Tell if you are in compliance;</i>
		<i>Tell if you are using best industry practices, and;</i>
		<i>What needs to be fixed and how.</i>
FEAST™	Prevents all hazards events by:	Telling you the type of events most likely to happen at your facility, and;
		Telling you how to prevent the events from happening.
FREE Tool™	Guides more effective responses to food emergencies by:	Using an automated system that assures the most timely and effective responses

# FOOD DEFENSE™ (FDTQ) HAS 40 CROSS CUTTING SURVEY QUESTIONS



# FOOD DEFENSE™ HAS 75 CATEGORY SPECIFIC SURVEY QUESTIONS

Adulteration of Food and Water	• Twelve Question Sets
Communicable Disease	• Eight Question Sets
Workplace Violence	• Six Question Sets
Improvised Destructive Devices	• Eight Question Sets
Fires and Arson	• Eleven Question Sets
Transportation Security	• Eight Question Sets
Nuclear, Biological, and Chemical Emergencies	• Eight Question Sets
Other Crimes	• Seven Question Sets
Natural Disasters	• Seven Question Sets

# THE FOUR COMPONENTS OF AN FDTQ QUESTION SET

## 1. Minimum Compliance Standards

For those questions addressed by government regulations, the minimum compliance level is defined as meeting the government requirement as contained in the Code of Federal Regulations (CFR's), USDA Directives, agency statute and state requirements.



## 2. Best Practices

Best practices go beyond minimum compliance and come from best science and risk-based standards.



## 3. Control Questions

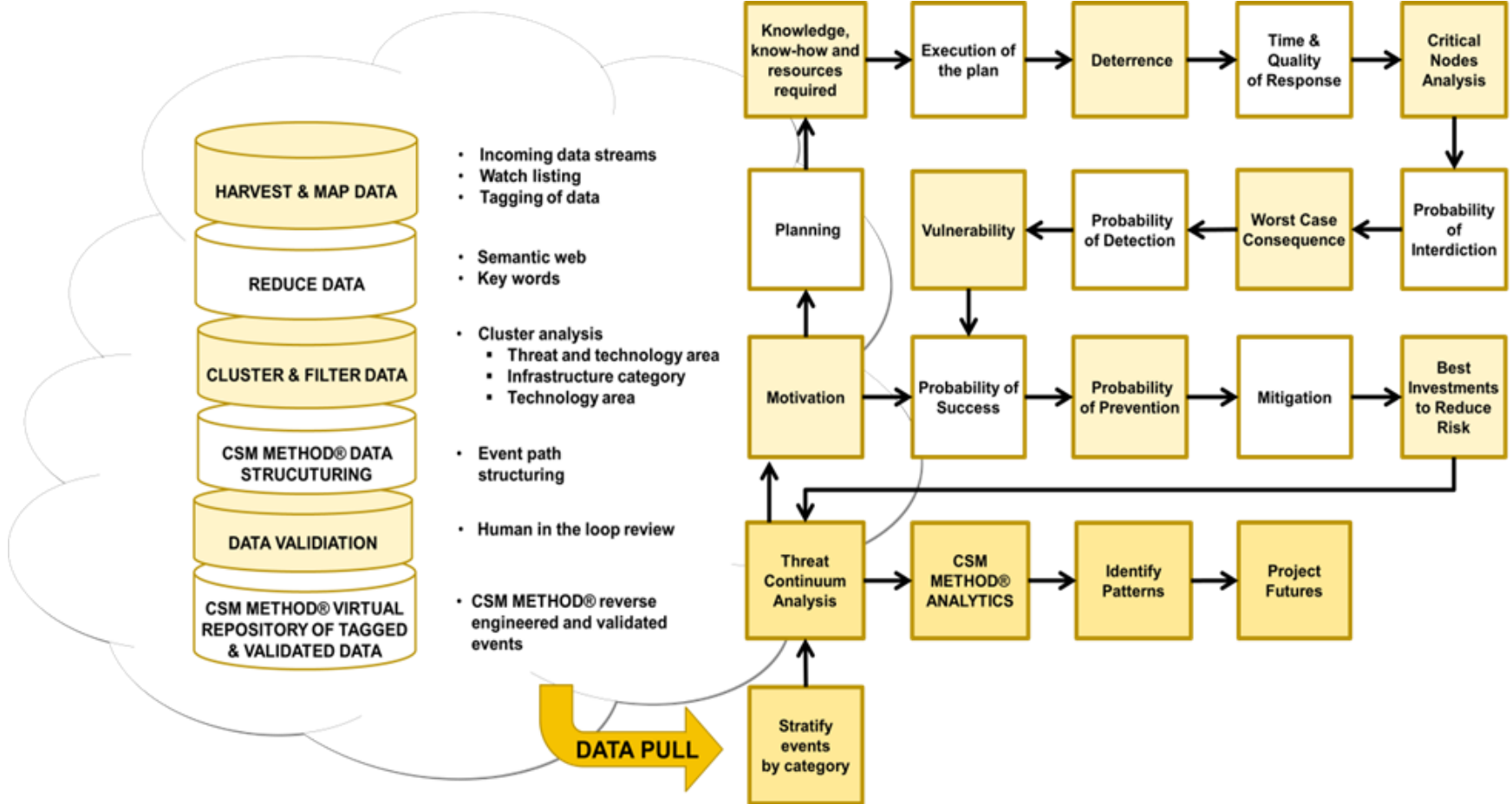
Control questions are designed to quantify varying levels of implementation of minimum compliance standards and science and risk-based standards.



## 4. References

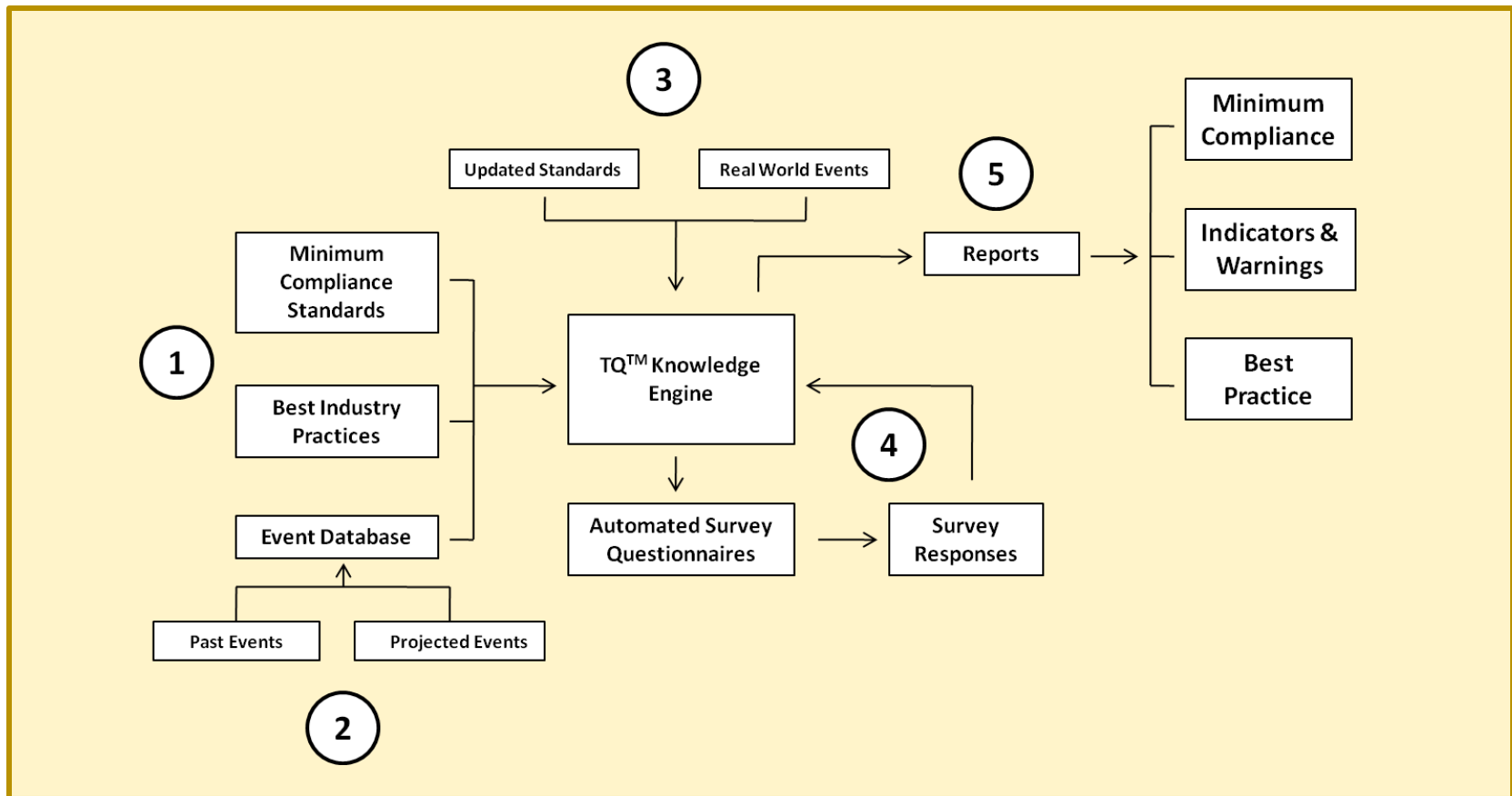
References are "hot linked" to the specific requirements of the CFR's; best industry practices and specific information further describing the minimum compliance regulations and/or science and risk-based standard.

# THE FOOD DEFENSE™ ARCHITECTURE





# THE FDTQ SOFTWARE STRUCTURE



1. Food Mapper™ compliance standards and best industry practices
2. POISON™ to provide past and projected events
3. Real time threat and risk warnings/continuous 24/7 update of Food Mapper™ and POISON™
4. & 5. Food DefenseTQ™ and Food SafetyTQ™ assessment

# FDTQ APPLIES A UNIQUE SET OF ALGORITHMS TO TRANSFORM DATA

Function	Algorithm	Description
Probability of Occurrence	$PO = f(v)(c)$	The probability of an adverse food event occurring (PO) is a function of the vulnerability (v) of the target multiplied by the worst case consequences (c) if the target were successfully attacked or interrupted
Mitigation	$(v)(c) = f_m$	The vulnerability of the target (v) multiplied by the consequences if it were successfully attacked or interrupted (c), become a function of the mitigating actions taken to prevent or limit the consequences of the attack or interruption as depicted by m
Natural Phenomenon	$(v) = f(PO)(c)$	For natural events the vulnerability of the target (v) is a function of the probability of the natural event occurring based on frequency, trends analysis and modeling projections (PO) multiplied by the worst case consequences (c) should the target be subjected to a natural event
Estimate of Event Sequence Interruption (EESI™)	$I = f(dn_t)(c_t)(dy_t)(r_t)(r_q)$	The interruption of an event sequence is a function of time of detection (dn <sub>t</sub> ), delay time (dy <sub>t</sub> ), time to communicate a response action (C <sub>t</sub> ), time to respond (r <sub>t</sub> ) and quality of response (r <sub>q</sub> )

# FDTQ USES MULTIPLE COMPUTER INTENSE DATA ANALYTICS

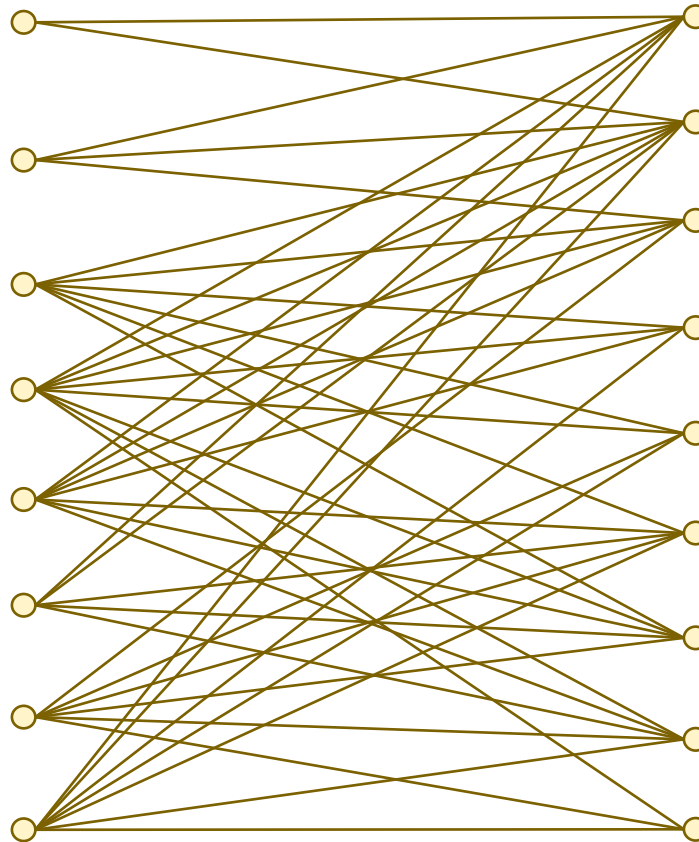
<b>EPA™</b> (Event Path Analysis)	Events are gathered, scientifically reverse engineered to produce event paths and grouped, based on category.
<b>(v)</b> (Vulnerability)	Each event is weighted based on the degree of vulnerability of the target.
<b>(c)</b> (Consequence)	Each event is weighted based on the potential worst case consequences of the event.
<b>PO</b> (Probability of Occurrence)	Each event is scored to produce a probability of occurrence (PO) value.
<b>Mitigation</b>	The factors that could mitigate the consequences of each event are systematically identified and weighted.
<b>CNA™</b> (Critical Nodes Analysis)	A set of baseline critical nodes representing intersecting activities, i.e., vertices, for each event path are identified.
<b>TCA™</b> (Threat Continuum Analysis )	Baseline values for deterrence, detection, prevention, response and mitigation are calculated for each critical node.
<b>FEAST™</b> (Food Event Analysis and Simulation Tool)	Critical nodes are weighted against “actual” and “expected” performance.
	Actual and expected performance are graphically portrayed.
	Best investments are graphically portrayed.
<b>EESI™</b> (Estimate of Event Sequence Interruption)	An estimate of the facility’s ability to prevent the event is calculated.
<b>DPA™</b> (Decision Path Analysis)	Each event is analyzed to identify critical decisions and decision paths to improve responses.



# FPTQ IS DESIGNED TO HELP COMPANIES BETTER MEET FOOD PROTECTION REQUIREMENTS

## Requirements

Science & risk-based standards
Mandatory recalls
Production of records
Mandatory food defense
Enhanced food safety
Prevention
Enhanced traceability
Increased inspection



## FPTQ Capability

Standards are vetted by scientists
Risk is quantitatively derived
Automated recall management
Epidemiological modeling
Automated record keeping
Perpetual food safety assessment
Perpetual food defense assessment
Modeling to prevent events
Computer guided responses