



Real World Food Safety

-- Food Bioterrorism & Risk Management --

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Purpose

- ◆ Understand the role of food and water in a bioterrorist event.
- ◆ Reinforce food safety practices to minimize the risk of potential food- or water-borne illness due to intentional and unintentional contamination.
 - Food/Water Vulnerability Assessment Guide (TG-188)
 - Food Risk Management (DA PAM 30-22)



Indicators of Today's Biological Agent Threat

- ◆ Iraq 1985-1991, developed anthrax, botulinum toxin, & aflatoxin.
- ◆ Tokyo, 1995 – Terrorist organization releases Sarin nerve agent in subway.
 - Failed in 1994 in attempt to release anthrax & botulinum toxin.



Feasibility of Biological Weapons

- ✓ **Low cost**
- ✓ **Readily available**
- ✓ **Low technological support**
- ✓ **Easily disseminated**
- ✓ **Difficult to detect**
- ✓ **Deniable**
- ✓ **Able to cause mass casualties**

TERRORISM: Longer incubation periods are more suitable for terrorist activities (*natural pathogens*)

- Allows time to distance terrorists from event.
- May appear to be natural epidemic or food related illness.



Scenario for Terrorist Attacks

- ◆ **Product tampering**
- ◆ **Sabotage of specific food groups or industries**
- ◆ **Attacks directed at a country's institutions, agencies, or departments**
- ◆ **Attack on ethnic groups in opposition to terrorist goals**



Domestic Use of Biological Weapons

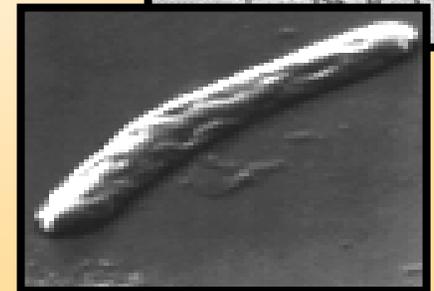
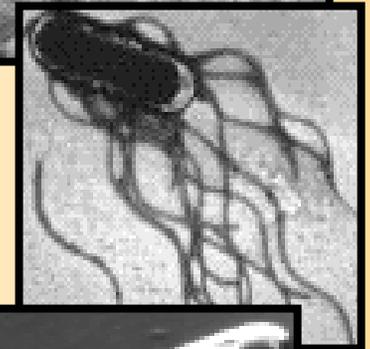
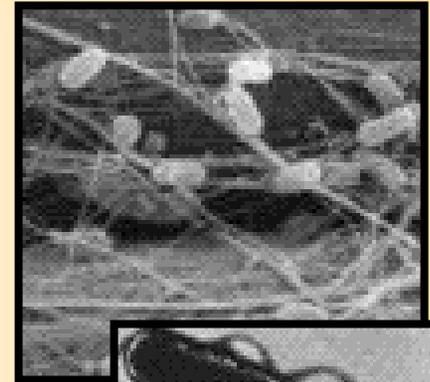
Oregon (1984) – Salmonella contaminated salad bars.

- ▶ 10 restaurants implicated; 751 cases of gastroenteritis
- ▶ Infected employees amplify spread of illness
- ▶ Errors in food rotation & refrigeration facilitated growth of organism



Potential Pathogens

- ◆ Numerous possibilities
- ◆ Vary from classical BW agents to natural food related pathogens.
- ◆ Could include viruses, bacteria, & toxins.
- ◆ Spore-forming pathogens may survive traditional food processing temperatures.





What is the Food Threat?

- ◆ **Public accessible foods**
- ◆ **Processed foods**
- ◆ **Water**
- ◆ **Uncooked foods**
- ◆ **Fresh fruits & vegetables**
- ◆ **Agent Vectors**



EXAMPLES

Processed Foods

- ▶ 30 grams of ricin toxin
- ▶ Easily concealed in a pocket
- ▶ Could lethally poison 150 pounds of meat
- ▶ Enough to produce 1,500 hotdogs

Fresh Fruits & Veges

...often not “washed” AND sanitized in field feeding operations.





EXAMPLE -- Water --

- ▶ Many pathogens survive in water
- ▶ Easily disseminated to public
- ▶ Bottled water common



- ◆ **ROWPU effective against toxins, bacteria, viruses, & parasites**
- ◆ **Coagulation/Flocculation not effective against pathogens (sediments only)**
- ◆ **Chlorination not effective against parasites & does NOT destroy Anthrax spores**



Foodborne Illness

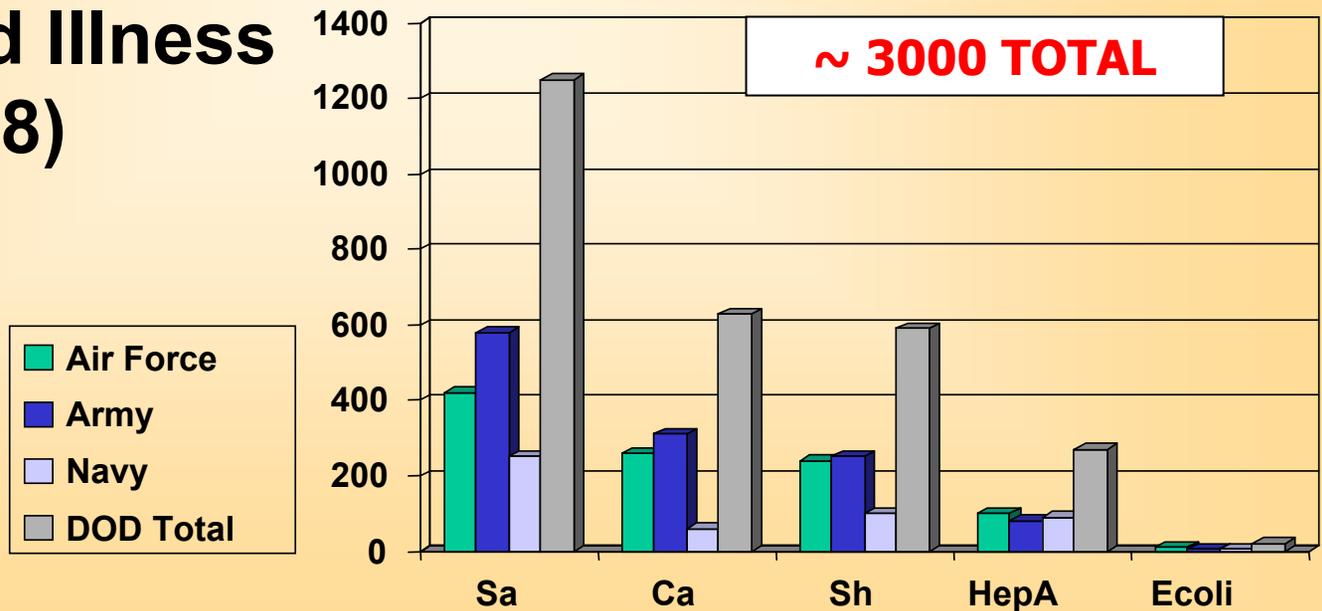
◆ Diagnosed Cases in U.S. are increasing
(Outbreaks in the News: E-Coli & Listeria)

76 million cases annually

325,000 hospitalizations

5,000 deaths

DOD Reported Illness (1996-98)





Foodborne Illness IS a Readiness Issue

- ◆ Americans average 1.4 cases of diarrhea each year
- ◆ Foodborne Illness = Loss of Unit Effectiveness
- ◆ Most cases are undiagnosed

1998, Saudi Arabia: 110 soldiers hospitalized for Salmonellosis after eating in base camp dining facility.

[43% of casualties came from a single infantry unit]

**Consider the effects of 1
contaminated meal in a
combat situation.**



Food and Water Antiterrorism

◆ Problem:

- No institutionalized process to address intentional contamination of food or water.
- Vulnerability surveys focus on conventional or aerosol attacks with collateral damage to food/water.
- Process & technology are inadequate to protect us.

Solution:

- ✓ ID secure food & water handling procedures.
- ✓ Validate new detection equipment.
- ✓ Institutionalized approach (Risk Management).



The Role of Army Food Service Personnel





Food Safety & Protection

Observations



- ◆ Improper handling of rations
- ◆ Inadequate temperature controls & monitoring
- ◆ Untrained, unqualified or inexperienced personnel
- ➔ Inadequate Supervision by Food Program Leaders
- ◆ Inadequate Surveillance by Medical personnel



Inspecting Subsistence

TISA: Installation Vet Personnel conduct routine inspections (Never 100%)

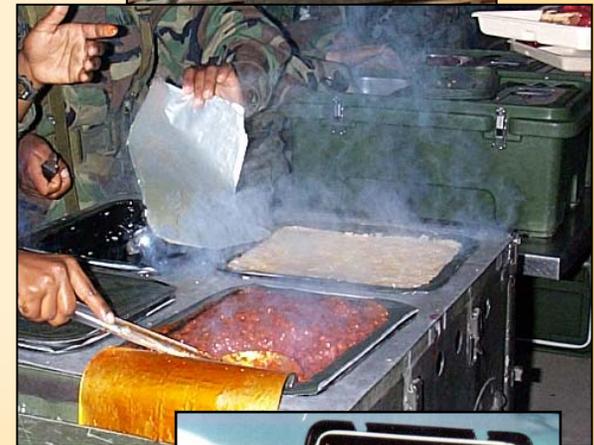
Unit: Ration personnel should check their rations upon receipt; Report suspect or questionable supplies to the AVI/TISO.





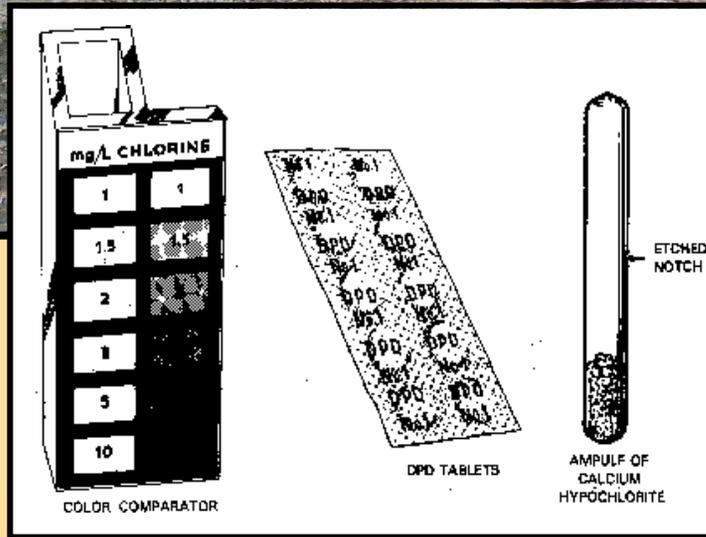
Temperature Standards

- ◆ Time and temperature discipline are critical in the prevention of bacterial growth.
 - Cold storage
 - Cooking
 - Hot holding (during serving and remote feeding)





Potable Water



- ✓ Inspect water trailer before use
- ✓ Obtain water from approved source or fill point
- ✓ Chlorinate to 1 ppm
- ✓ Protect from contamination



Knowing the standards does not assure safety...food processes must be managed and supervised at all levels.

‘Risk management is the Army’s principal risk-reduction process to protect the force.

...Our goal is to make risk management a routine part of planning and executing operational missions.’

Chief of Staff, Army, July 1995



Risk Assessment / HACCP

- ◆ **Conduct unit level risk assessment of the biological threat; conduct food operations risk assessment based on your menu.**
 - **Employ HACCP/Food RM Principles**
 - **CHPPM TG-244, The Medical NBC Battlebook**
http://chppm-www.apgea.army.mil/armydocs.asp?pub_type=TG
 - **Need to identify potential points of human intervention based on ease and accessibility**



TG 188

U.S. Army Food and Water

Vulnerability Assessment Guide

(Feb 02)

*Prepared by USACHPPM & DoD
Veterinary Service Activity*



Food Security Assessment Team (FSAT)

- ◆ **Designated by installation Cdr:**
 - Installation Force Protection Officer
 - Inst. Preventive Medicine Officer
 - Inst. Veterinary Corps Officer
 - Inst. Food Advisor
 - CID
 - Military Intelligence
 - Others...
- ◆ **Applies RM process to review & assess installation food systems.**

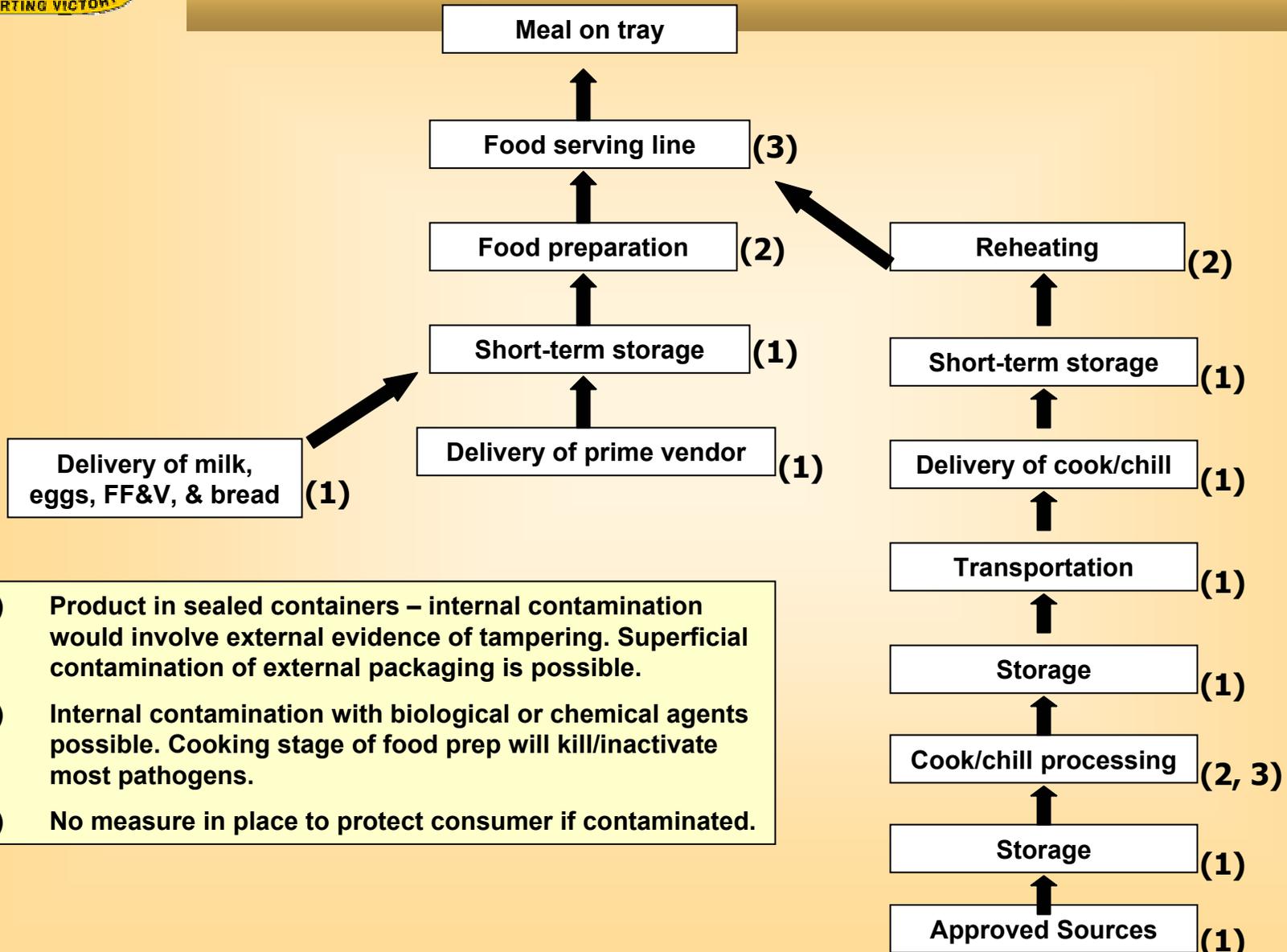


Vulnerability Assessment

- ◆ ID all food assets
- ◆ Describe installation food procurement sources & distribution from their sources.
- ◆ Develop flow diagrams for each asset to identify vulnerable areas:
 - Supply
 - Distribution
 - Storage
 - Retail sale or Preparation & Serving



Example: DFAC Flow Diagram





Risk Management

-- Develop Controls --

◆ Educational

- Cooks, Contractors, Commanders, CID, Force Protection personnel, etc...
- Food safety & Sanitation/Hygiene practices
- ID signs of contamination/tampering
- ID signs/symptoms of illnesses due to NBC

◆ Physical

- Security; Facility Access; Periodic Inventories

◆ Avoidance

- Personnel checks; Review Menu; Food Safety Practices



DA Pam 30-22
Chapter 3, Para. 3-7
Installation Food Protection
Programs



The Army Food Program

- ◆ **AR 30-22, The Army Food Program, 30 Aug 02**
 - Consolidates ARs 30-1, 30-16, 30-18, & 30-21
 - Provides Program policy
 - Requires establishment of an installation Food Program Management Office
- ◆ **DA Pam 30-22, Operating Procedures for the Army Food Program, 30 Aug 02**
 - Provides basic guidance for program execution



DA Pam 30-22, Para. 3-7

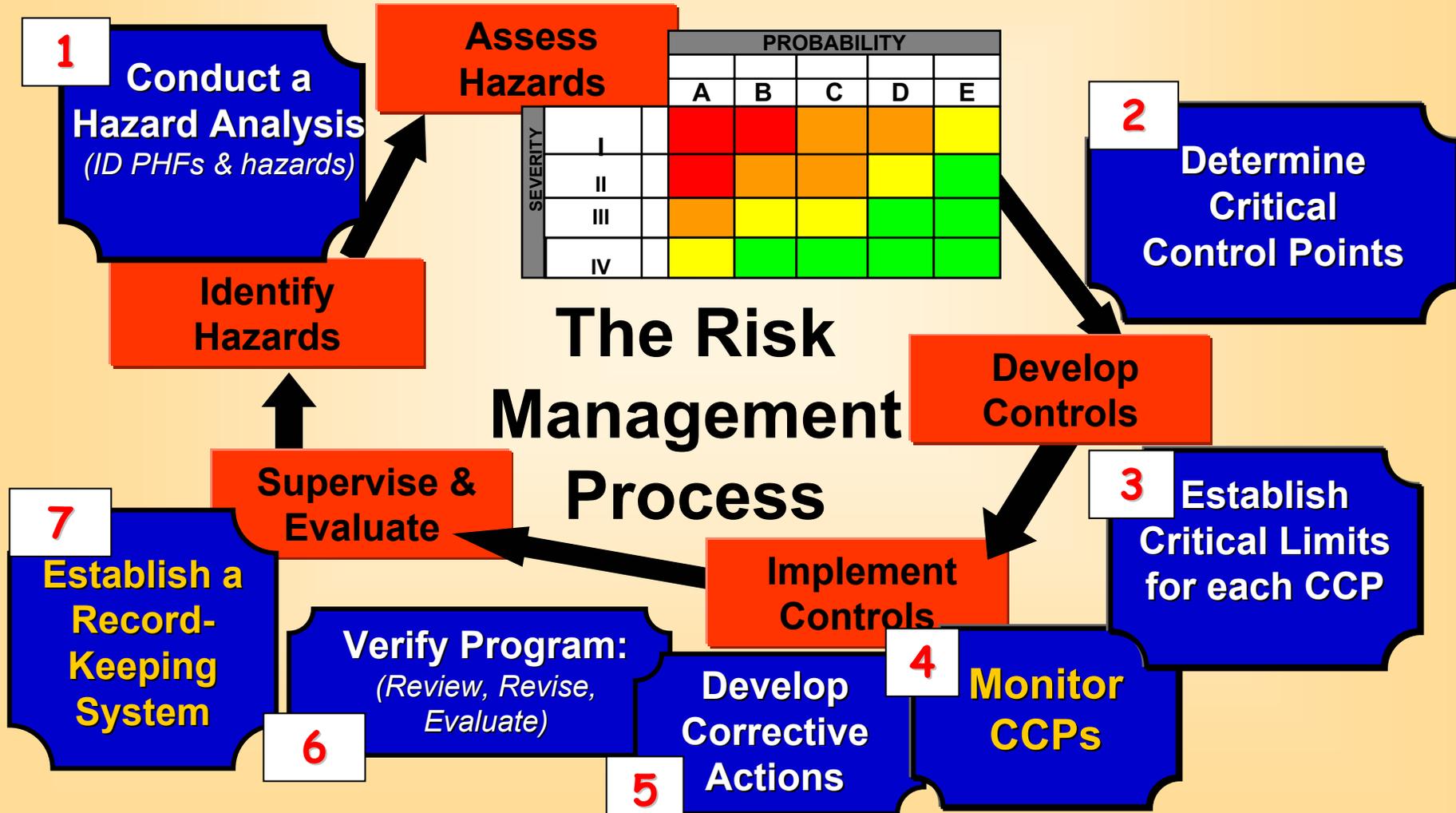
- ◆ Proactive development & execution of food safety & sanitation procedures.
- ◆ Installation food safety & sanitation program requirements:
 - Food risk management
 - Food safety & sanitation training
 - Integrated pest management

...promotes the efficient allocation of resources by identifying systemic problems associated with facilities, equipment, or personnel training.



Food Risk Management

Food RM = Applying HACCP Principles





Food Risk Management

...enhances the prevention of food-borne illnesses by systematically applying prescribed food protection & sanitation standards.

- ◆ Monitor time & temperature controls for PHFs.
- ◆ Incorporation of HACCP principles:
 - Monitoring Procedures
 - Application of Critical Limits
 - Record Keeping
- ◆ Defined Processes for Monitoring:
 - Cold holding & storage
 - Hot holding
 - Cooking
 - Cooling (leftovers, pre-prepared items)



Table 3-1: Minimum Monitoring Requirements

Responsible Agent	Process	Number of Samples & Frequency		Monitoring Criteria
Food Operations Sergeant / Manager	Cold Storage	All units	Once each meal period (<i>Breakfast, Lunch, Dinner</i>)	<ul style="list-style-type: none"> • Monitor all refrigeration units... • Verify the ambient temp... • Record temperature on data log.
Food Operations Sergeant / Manager	Cooking	3 menu items	Each meal period	<ul style="list-style-type: none"> • Spot-check at least 1 meat,... • Spot-check 2 or more other... • Monitor internal product temp... • Record internal food temp...
Food Operations Sergeant / Manager	Cold Holding	3 items	Each meal period	<ul style="list-style-type: none"> • Spot-check at least 1 meat,... • Spot-check 2 or more other... • Monitor same menu items... • Record internal food temp...



Table 3-1 (continued)

Food Operations Sergeant / Manager	Hot holding	3 menu items	Each meal period	<ul style="list-style-type: none"> • Spot-check at least one meat... • Spot-check 2 or more other... • Monitor the same menu items... • Record internal temp on data log...
Food Operations Sergeant / Manager	Cooling	All hot items cooled as a leftover	Each meal period	<ul style="list-style-type: none"> • Must record time cooling started, time internal temp reached 70F or below, and time temp reached 40F or below. • NOTE: Hot items must be cooled...
Food Operations Sergeant / Manager	Re-heating leftovers	All left-overs intended to be served hot	Each meal period	<ul style="list-style-type: none"> • An internal product temp of 165F must be attained w/in 2 hours • Record start time, finish time, & end temp on Cooking data log sheet. <p><i>All foods being reheated are noted...</i></p>
Food Advisor or Food Program Manager	Audit of food service facilities	Each facility or food service operation	Monthly	<ul style="list-style-type: none"> • Use the HACCP Monitoring Report from TB MED 530. • Focus on the <i>processes</i>... • Provide copy of audit to food operations sergeant; file original...



Temperature Standards

CAT	FOOD	Temperature Standards [° F]
1	Beef Roasts and Corned Beef Roasts (<i>3 minutes minimum</i>). Whole muscle beef steaks, Lamb, & Veal; Made-to-order eggs; Fish; Canned Hams. (<i>15 seconds minimum</i>)	145 (<i>Internal product temp</i>)
2	Ground beef products (<i>hamburgers, cubed steak</i>); Pork products; Bulk-prepared scrambled eggs;	155 (<i>Internal product for 15 sec</i>)
3	Poultry products; Stuffed products (<i>meats, pastas, peppers, etc...</i>); Re-heated leftovers; Microwaved foods;	165 (<i>Internal product for 15 sec</i>)
4	All cooked foods held hot on the serving line and in warmers; (hot served) Vegetables & Ready-to-eat foods packaged by industry.	140 (<i>Internal product</i>)
5	All chilled PHFs in refrigerated storage, cold sandwich bars, & salad bars: <i>cut fruits & vegetables; mixed salads (potato, tuna, chicken, egg, etc...); custards & puddings.</i>	40 (<i>Internal product</i>)
6	All refrigeration units (<i>reach-in & walk-in</i>); salad bars; sandwich bars; dessert bars (<i>containing custards & puddings</i>).	38 (<i>Ambient</i>)



DA 7458 - Cooking

RISK MANAGEMENT DATA LOG - COOKING						
For use of this form, see DA PAM 30-22; the proponent agency is DCS, G4.						
1. DATE (YYYYMMDD) 20020531	2. MEAL <input type="checkbox"/> BREAKFAST <input checked="" type="checkbox"/> LUNCH <input type="checkbox"/> DINNER <input type="checkbox"/> OTHER _____					
PROCESS: COOKING AND/OR REHEATING LEFTOVERS CATEGORY: 1 (≥ 145F) 2 (≥ 155F) 3 (≥ 165F)			3a. MONITORED BY SSG Piggott		3c. UNIT 49th STB DFAC; 8400 Ft. Lee	
3b. TITLE Shift Leader						
4. EQUIPMENT NAME	5. FOOD/MENU ITEM AND CATEGORY	6. INTERNAL TEMP (F)	7. TIME	8. CORRECTIVE ACTION <i>Mandatory for non-compliance</i>		9. COMMENTS
				CONTINUE COOKING	RECHECK OF TEMP	
Combi oven #1	Roast pork CAT: 2	138	1100	<input checked="" type="checkbox"/>		re-check temp in 10 minutes; continue to monitor every 10 min until 155 F is achieved
		152	1115	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
		158	1125		<input checked="" type="checkbox"/>	
Range	Leftover chili with beef CAT: 3	162	1105	<input checked="" type="checkbox"/>		re-check temp in 10 minutes
		168	1115		<input checked="" type="checkbox"/>	
Steam kettle	Chicken noodle soup CAT: 3	168	1105			
Combi oven #2	Steamed rice CAT: 1	170	1120			
Griddle, short order #1	Grilled hamburger CAT: 2	160	1130			
Deep fat fryer	Chicken nuggets CAT: 3	182	1133			

Spot check internal cooking temperatures at end of programmed cooking cycle. Continue cooking if temperature standard not achieved. Make a note in the comments and take a follow-up temperature.



DA 7459 – Hot/Cold Holding

RISK MANAGEMENT DATA LOG - HOT OR COLD HOLDING/STORAGE				
For use of this form, see DA PAM 30-22; the proponent agency is DCS, G4.				
1. DATE (YYYYMMDD) 20020531		2. MEAL <input type="checkbox"/> BREAKFAST <input checked="" type="checkbox"/> LUNCH <input type="checkbox"/> DINNER <input type="checkbox"/> OTHER _____		
3. PROCESS <input checked="" type="checkbox"/> HOLDING <input checked="" type="checkbox"/> STORAGE <input type="checkbox"/> HOT <input checked="" type="checkbox"/> COLD CATEGORY: 4 (hot ≥ 140F) 5 (cold holding ≤ 40F) 6 (cold storage ≤ 38F)		4a. MONITORED BY SSG Piggott		4c. UNIT 49th Special Troops BN DFAC; 8400 Ft. Lee
4b. TITLE Shift Leader				
5. LOCATION	6. FOOD/MENU ITEM	7. TIME	8. TEMP (F)	9. CORRECTIVE ACTION <i>Mandatory for non-compliance</i>
reach-in #1		1115	38	
CAT: 6	<input checked="" type="checkbox"/> AMBIENT TEMP			
reach-in #2		1118	38	
CAT: 6	<input checked="" type="checkbox"/> AMBIENT TEMP			
reach-in #2	macaroni salad	1120	52	place in ice bath for rapid cooling
		1135	37	
CAT: 5	<input type="checkbox"/> AMBIENT TEMP			
walk-in refer		1125	39	OK - within +/- 2 F
CAT: 6	<input checked="" type="checkbox"/> AMBIENT TEMP			
salad bar #1	macaroni salad	1138	37	
		1210	40	
		1230	44	discard after meal (1330) Adjust salad bar temperature down
CAT: 5	<input type="checkbox"/> AMBIENT TEMP			
salad bar #1	potato salad	1138	40	
		1200	44	discard after meal (1330); place ice around food
		1230	47	Call in work order to adjust salad bar temp
CAT: 5	<input type="checkbox"/> AMBIENT TEMP	1335		Work order #QAF01512J
salad bar #2	fruit cocktail	1142	40	
		1205	40	
		1235	42	self-serve, discard after meal (1330)
CAT: 5	<input type="checkbox"/> AMBIENT TEMP			

Record follow-up temperature checks in column 7 for original item entries that were found deficient. When holding items hot or cold for more than 1 hour during a meal period, a minimum of two temperature checks are required. (Establish an SOP for monitoring interval.)



DA 7460 - Cooling

RISK MANAGEMENT DATA LOG - COOLING COOKED ITEMS			
For use of this form, see DA PAM 30-22; the proponent agency is DCS, G4.			
1. DATE (YYYYMMDD) 20020531	2. MEAL <input type="checkbox"/> BREAKFAST <input checked="" type="checkbox"/> LUNCH <input type="checkbox"/> DINNER <input type="checkbox"/> OTHER _____		
PROCESS: COOLING Hot leftovers must be cooled to ≤ 70F within 2 hours, then to ≤ 40F within an additional 4 hours.		3a. MONITORED BY SSG Piggott	3c. UNIT 49th STB DFAC, 8400 Ft. Lee
3b. TITLE Shift Leader			
4. FOOD/MENU ITEM	5. COOLING DATA	6. CORRECTIVE ACTION <i>Mandatory if cooling time not met</i>	
Roast pork	START TIME: 1300	<input type="checkbox"/> RAPID REHEAT TO 165F <input type="checkbox"/> DISCARD <input type="checkbox"/> REDUCE BATCH SIZE <input checked="" type="checkbox"/> ICE BATH <input type="checkbox"/> STIR <input type="checkbox"/> SLICE <input checked="" type="checkbox"/> OTHER <u>slices layered in 2-inch pan</u>	
	TIME TEMP (F)		
	1320 78		
	1340 52		
	1350 40		
Chili with beef	START TIME: 1305	<input checked="" type="checkbox"/> RAPID REHEAT TO 165F <input type="checkbox"/> DISCARD <input type="checkbox"/> REDUCE BATCH SIZE <input type="checkbox"/> ICE BATH <input type="checkbox"/> STIR <input type="checkbox"/> SLICE <input checked="" type="checkbox"/> OTHER <u>placed in 5 gal pot in walk-in for use at dinner</u>	
	TIME TEMP (F)		
	1320 148		
	1400 132		
	1500 98		
Re-heated chili with beef from previous line	START TIME: 1530	<input type="checkbox"/> RAPID REHEAT TO 165F <input type="checkbox"/> DISCARD <input checked="" type="checkbox"/> REDUCE BATCH SIZE <input checked="" type="checkbox"/> ICE BATH <input checked="" type="checkbox"/> STIR <input type="checkbox"/> SLICE <input checked="" type="checkbox"/> OTHER <u>corrective training for proper cooling provided to cook</u>	
	TIME TEMP (F)		
	1530 168		
	1545 112		
	1600 68		
	START TIME:	<input type="checkbox"/> RAPID REHEAT TO 165F <input type="checkbox"/> DISCARD <input type="checkbox"/> REDUCE BATCH SIZE <input type="checkbox"/> ICE BATH <input type="checkbox"/> STIR <input type="checkbox"/> SLICE <input type="checkbox"/> OTHER _____	
	TIME TEMP (F)		

DA FORM 7460

USAPA V1.00



How to Implement

- ◆ Blank DA Forms 7458, 7459, and 7460 on hand.
 - Provide clipboard for each form
 - Make clipboards accessible to all shift leaders/supervisors
- ◆ FOS reviews programmed menu for the week.
 - Pre-select menu items to be monitored for each meal period each day
 - Enter item description & Category on appropriate forms (cooking, cold holding, hot holding)
 - Identify individuals responsible for monitoring (by meal period and day)



How to...

- ◆ FOS spot checks monitoring logs at end of each meal period.
 - Ensure monitoring was performed
 - Ensure forms completed properly
 - Ensure forms are legible
 - Note any food safety violations
- ◆ FOS Collects & Files Monitoring Logs.
 - At end of each day
 - Note reoccurring discrepancies
 - File with PM inspection reports



How to...

Follow-up Actions

- ◆ Program training to address reoccurring deficiencies
 - Cooking temperatures
 - Hot/cold holding temperatures
 - Cooling methods
 - Thermometer calibration
- ◆ Initiate & track work orders to correct faulty equipment
 - Hot water capability of steam table
 - Temperature calibration of warming units, griddles, ovens, and refrigerators



Conclusions

- ◆ Food as a vehicle for bioterrorism has been used.
- ◆ The potential for bioterrorism in the future is credible.
- ◆ Detection technology for biological agents is lacking (*Has limited reliability*).
- ◆ Risk management is key to ensure safe food.
- ◆ Food operations sergeant must be vigilant in food safety practices & food protection measures.



QUESTIONS

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