

FOOD DEFENSE MANAGEMENT PRACTICES IN PRIVATE COUNTRY CLUBS – A CASE ANALYSIS

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ABSTRACT

This field study investigated food biosecurity practices in private country clubs in the Midwestern United States. Interviews with managers and observations of actual operational practices were conducted to identify areas in country clubs that could be at potential risk of a bioterrorist attack. Cost and lack of need were identified as barriers to implementing a food defense management plan. Background checks and good employment practices were perceived as effective in increasing food biosecurity in clubs. Recommendations to improve food biosecurity in country clubs included background checks for all employees, securing access to chemicals, and issuing identification badges to all employees.

Keywords: food defense, club management, bioterrorism

INTRODUCTION

Food Biosecurity

Safety and security is a concern of country club managers. This includes the security of the food prepared for club members. The terrorist attacks on New York City and the Pentagon on September 11, 2001, closely followed by anthrax attacks on governmental officials and members of the media, forever changed public perceptions of safety and security in the United States (U.S.). Following these incidents, increased priority was placed upon the safety and security of the food supply (Rasco & Bledsoe, 2005). Bioterrorism is defined as the “intentional use of biological or chemical agents for the purpose of causing harm” (United States Department of Agriculture Food and Nutrition Service, 2004). The USDA defines food biosecurity as the “protection of food from bioterrorism” (United States Department of Agriculture Food and Nutrition Service, 2004). The National Restaurant Association (NRA) defines food security (also known as food defense) as “preventing or eliminating the deliberate contamination of food” (National Restaurant Association Educational Foundation [NRAEF], 2003).

The food supply chain, from production to consumption of food, is commonly called “farm to fork” or “farm to table” (Food and Drug Administration, 2014). Threats to food biosecurity may occur in any portion of the food supply chain (NRAEF, 2003). For the purpose of this study, individuals or groups who intentionally contaminate or harm food products will be referred to as bioterrorists. A bioterrorist is any individual who intentionally contaminates food including business competitors, people posing as customers, employees, vendors, and anyone with a malicious agenda or cause (NRAEF, 2003). Bioterrorists may be motivated by attention/publicity, financial benefit, thrill-seeking, revenge/retribution, humor/prank, notoriety, creating chaos, obtaining a competitive advantage, and political/ideological differences (AIB International, 2006).

Although no publicly documented incidents of food terrorism have occurred in country clubs, former incidents of food bioterrorism

demonstrate the necessity of food defense practices. The Rajneeshee religious cult contaminated an Oregon restaurant’s salad bar with *Salmonella Typhimurium* in 1984, affecting an estimated 751 people. The cult’s motivation was to try to influence the outcome of a local election (AIB International, 2006). Ground beef purchased in a Michigan supermarket in 2003 was responsible for making 148 individuals ill. It was later discovered that 200 pounds of ground beef had been purposefully contaminated with insecticide by a disgruntled employee of the supermarket (Centers for Disease Control and Prevention, 2003). Methomyl, a highly-toxic pesticide, was used to intentionally contaminate salsa served at a Mexican restaurant in Lenexa, Kansas in 2009. Two employees of the restaurant were charged, both who were relatives of the restaurant owner. Revenge was identified as the motivational factor to poison the restaurant’s salsa that resulted in 48 customers becoming seriously ill (United States Department of Justice, 2010).

Country club managers should be aware of the dangers posed by bioterrorism because they oversee the final step of the food supply chain, where food is prepared and served to members. Creating a food defense management plan that outlines preventive practices to be implemented within a foodservice operation should be the most effective method to decrease the threat of bioterrorism (Bledsoe & Rasco, 2002; United States Department of Agriculture Food and Nutrition Service, 2004).

Terrorism

The terrorist attacks against the United States on September 11, 2001 showed a worldwide audience how terrorism could create chaos and strike fear within society. The combined attacks of September 11th caused 3,056 deaths (Bogen & Jones, 2006). In the weeks after September 11th, two U.S. Senators and members of the media received letters that contained anthrax spores, resulting in 17 people becoming ill and five deaths. This was regarded as the worst case of biological terrorism in U.S. history (Federal Bureau of Investigation, 2014a). Although the anthrax-laced letters were mailed to only a few individuals, many U.S. citizens were understandably concerned about opening their mail, a potentially lethal activity (Hall et al., 2003).

Governmental agencies and international organizations have increased their efforts to counter bioterrorism since 2001. No longer can governments, businesses, and institutions (including country clubs) dismiss the possibility of intentional biological attacks upon their organizations. Taking precautions, effective monitoring, and response capability are vital to managing bioterrorism and food safety emergencies (World Health Organization, 2002).

Previous Bioterrorism Research Conducted in Foodservice

Country club foodservice operations are one of the endpoints of the food chain (the “fork”) where final food preparation occurs before service to customers. Prior research was conducted in school and hospital foodservice operations in the United States regarding food bioterrorism (Yoon & Shanklin, 2007a; Yoon & Shanklin, 2007b; Yoon & Shanklin, 2007c). Yoon and Shanklin (2007) researched foodservice

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operators' importance perceptions, implementation frequency of preventive practices, and self-efficacy measures in the development of a food defense management plan. Operators who were more concerned and cautious of threats of food bioterrorism performed preventive practices more often than foodservice operators who were less concerned and less cautious of food bioterrorism (Yoon & Shanklin, 2007c). Foodservice operators identified chemical use and storage practices as the largest concern in protecting their operations from bioterrorism; these were the most frequently implemented practices in their operation (Yoon & Shanklin, 2007a). Yoon and Shanklin's research concluded that greater awareness of foodservice operators and the implementation of preventive practices in foodservice operations can enhance levels of food defense against bioterrorism (Yoon & Shanklin, 2007b). It is not unreasonable to suggest that Yoon and Shanklin's conclusions could be applied to foodservice operations outside of hospitals and schools. For this study, private country club foodservice operations were identified to continue Yoon and Shanklin's research in food bioterrorism.

Statement of Problem

Private clubs are governed by a board of directors, which consists of club members elected by their peers. Legal duties that the board of directors assumes include the duty of care – taking precautions while governing the club that an “ordinarily prudent” individual would take (Perdue & Koenigsfeld, 2013). In private clubs, the board of directors establishes club policies, and the club's general manager manages the club. This shared relationship of the governance of the club by the board of directors and the management of the club by the club manager is unique to private clubs.

Clubs are exclusive and typically only invite affluent and influential individuals (along with their families) to join their membership (Walker, 2009). Examples of people frequenting private clubs (members, their guests, or non-members) include: prominent citizens, business executives, celebrities, and government officials, all of whom could potentially be selected as targets by bioterrorists. In the past, affluent individuals have been targeted by kidnappers and terrorist groups in past high-profile cases such as John Paul Getty III (grandson of billionaire J. Paul Getty, founder of the Getty Oil Company) and Patty Hearst (granddaughter of the wealthy newspaper publisher, William Randolph Hearst) (Federal Bureau of Investigation, 2014b; Weber, 2011). Kwoh (2012) reported that 30% of U.S. companies pay for security services for their CEOs, including the Las Vegas Sands Corporation (\$2.6 million spent annually) and the defense contractor Northrop Grumman Corporation (\$2.2 million spent annually). Northrop spokesperson Randy Belote stated, "We don't consider providing security protection for our senior executives as an option, but as critically important" (Kwoh, 2012). Private clubs, which typically exclude non-affluent individuals from their membership rolls, may unintentionally project an image of wealth and privilege to non-members. Because private clubs are exclusive and cater to affluent, powerful, and influential individuals, they could be considered as potential targets to would-be bioterrorists.

Club members consider their club as an extension of their business as well as a home-away-from-home and will use its facilities for both business and leisure (Angelo & Vladimir, 2004; Perdue & Koenigsfeld, 2013). Nearly all U.S. private clubs have food and beverage facilities and serve food procured and prepared from the U.S. food supply (Walker, 2009). The safety and security of food served in private clubs ultimately resides with the club's general manager, who is directly responsible for supervising all club professionals and department heads (Perdue & Koenigsfeld, 2013). The service of food and beverages is generally at the center of all club events. To facilitate

these events, private clubs employ foodservice workers and banquet servers. These positions may have up to a 285% annual turnover rate, due to significant numbers of seasonal employees hired to meet peak demands (Aziz et al., 2007). Temporary foodservice employees may be utilized to provide additional labor during busy times in club operations (e.g. summer and holiday seasons), meaning that workers come and go year-round. This high turnover rate along with the use of temporary employees can complicate attempts at conducting background checks or thorough verification of job references. Background checks can be easily run on every line-level employee, including temporary employees who may be hired for busy times of the year; however this may be cost prohibitive to the club.

Food prepared in large quantities is easy to contaminate, thus banquets held at private clubs may present a bioterrorist (possibly an employee of the operation) the opportunity to harm 200 people or more at a time. One disgruntled employee could intentionally contaminate food or beverages served to members and cause extensive harm to club members, their guests, and club employees. Food production equipment that combines large batches of food ingredients together, such as a floor mixer, offer a would-be bioterrorist an ideal opportunity for contamination. Additionally, equipment located in low-traffic or out of the way areas, such as an icemaker in a side room, could provide opportunities for intentional contamination with little chance of being detected. Following the physical damage from a bioterrorism attack, the psychological aftereffects and shock value may linger on. Members might resign from the private club, even if they were not among those directly impacted by an incident of intentional food contamination.

Food biosecurity threats are predicted to be likely in the future and are relatively simple to execute (Bledsoe & Rasco, 2002). Regardless of the motivations or types of bioterrorists, the ultimate outcome is purposefully harming humans using food intentionally contaminated with biological, chemical, or physical agents (World Health Organization, 2002). Many biological agents and readily available chemicals can be used to intentionally contaminate food (AIB International, 2006). Governmental agencies recommend implementing a food defense management plan to manage the risk of bioterrorism (Bledsoe & Rasco, 2002; United States Department of Agriculture Food and Nutrition Service, 2004). Prior research has concluded that increasing awareness of foodservice operators and implementing preventive practices to address bioterrorism can increase levels of food defense in foodservice operations (Yoon & Shanklin, 2007a, 2007b, 2007c). Limited research has been conducted regarding bioterrorism in retail foodservice and no bioterrorism research has been conducted in private clubs.

Foodservice professionals should be knowledgeable of the risks of food bioterrorism as they are responsible for supervising the endpoint of the food supply chain - the preparation and service of wholesome food to the public. Some foodservice operations have implemented crisis management plans to address events such as workplace emergencies and natural disasters. However, crisis management plans do not adequately deal with intentional contamination of food or an operation's water supply. Populations at high risk for foodborne illness, such as immune-compromised individuals, may have additional health issues that may complicate a full recovery from an event such as food bioterrorism (NRAEF 2012; Yoon & Shanklin, 2007c). Foodservice operators should revise their crisis management plans in order to secure their operation against food bioterrorism (Bledsoe & Rasco, 2002; Bruemmer, 2003; United States Department of Agriculture Food and Nutrition Service, 2004; Yoon & Shanklin, 2007a)

Past research has focused upon foodservice operators' importance perceptions of bioterrorism and preventative practices implemented in hospital and school foodservice operations to protect food from intentional contamination (Yoon & Shanklin, 2007a, 2007b, 2007c). Foodservice in private country clubs is technically classified as a part of the commercial foodservice segment and country club members are considered to be a "hybrid of customer and owner" (Gregoire, 2013). However, one can draw parallels to the definition of the onsite foodservice segment in that foodservice is not usually the primary activity or goal of country clubs and a profit is not necessarily desired. To the best of our knowledge, there has been no research in country club foodservice operations that has studied club professionals' importance perceptions and preventative practices regarding food bioterrorism.

Purpose of Study

This research involved conducting interviews with managers of country clubs and observations of actual practices in club operations. The purpose of the study was to identify areas within country clubs that could be at potential risk of bioterrorism due to their operational practices. Based on results of the interviews and observations, recommendations for country club managers are presented.

METHODS

Population and Sample

The population used for this study was country clubs within a 500-mile radius of Manhattan, Kansas whose managers were members of Club Managers Association of America (CMAA). Country clubs were selected for the study because they are the most common type of private club in the United States (Perdue & Koenigsfeld, 2013). The CMAA member directory was used with permission to identify country club professionals to contact for the field study. Twenty-five private country clubs were included in the field study. Country clubs in the Midwest including clubs in Kansas (14), Iowa (5), Nebraska (4), and Missouri (2) comprised the convenience sample and were selected given their close proximity to Kansas State University. Country clubs were visited during regular business hours. Visits to country clubs were scheduled during key production times at lunch or dinner from February through June 2010. Country club managers were contacted via telephone; after explaining the purpose and goals of the study, they were asked to participate in a personal interview and to allow the researcher to observe their respective country club's premises (i.e. the field study). Of 33 club managers contacted, two declined to participate in the field study. One manager who declined indicated that the field study would touch upon sensitive issues in their club and another manager simply refused, citing no reasons. A total of 31 clubs were visited during the course of the field study. Clubs not used in the final data collection included one club selected for the pilot study, two clubs in which the club managers were not available at the time of the scheduled visit even though they had indicated they would be available at the designated time, and three clubs in which access to observations of the clubs' foodservice operations was restricted during the visit. A total of 25 clubs composed the final sample for the field study. The average club size in terms of memberships was 491 (each membership could include a whole family). An annual foodservice operating budget of under \$2,000,000 was reported for 62% of clubs, with 38% reporting an annual budget of \$2,000,000 - \$5,000,000.

Development of Field Study Instruments

Open-ended interview questions were developed from the literature review and ideas generated in an elicitation study that identified items to use in a separate survey research project. Interview questions were used to further explore club professionals'

perceptions regarding food defense in their operation. The interview questions included knowledge of food biosecurity resources, resources needed for food defense, training needs, and policies and procedures in club operations. The interview questions are summarized in Table 1.

Permission was obtained to modify previous observation instruments that were used to conduct food defense and bioterrorism research in school foodservice (Yoon & Shanklin, 2007a, 2007b, 2007c). The observation instrument was adapted for use in country clubs using items identified in the literature review and in the aforementioned elicitation study. The adapted instrument included sections to record observations for the following criteria in country clubs: areas outside each country club, clubhouse receiving areas, clubhouse storage areas, clubhouse foodservice / food preparation areas, chemical storage areas, foodservice equipment, foodservice personnel, utility security, and general clubhouse security items. The observation instrument (with results from the 25 clubs visited) is presented in Table 2.

Pilot Study and Refinement

Field study instruments (the interview guide and the observation form) were pilot tested in one country club in Kansas. Feedback from the club manager during the pilot test helped to establish the interview format and how to ask the questions clearly and concisely. Changes made to the observation instrument included deleting the "n/a" (not applicable) checkbox from the "observed/reported" columns to avoid confusion with "yes/no" checkboxes. A blank space used for comments was substituted in place of the "n/a" checkbox. Cash handling was also deleted as private clubs typically operate with minimal cash exchange between staff and club members.

Data Collection

Club managers were interviewed in all 25 country clubs. Prior to visiting each club, the investigator sent club managers an e-mail containing a set of Internet links (URLs) to background literature regarding food biosecurity. This provided club managers with some background information about food biosecurity and was intended to help facilitate discussion. Interviews were conducted by one person, and were recorded with notes.

In four of the 25 interviews, additional club professionals were invited to participate (per the club manager's discretion in all interviews). This included executive chefs, food and beverage directors, and assistant club managers. Probing, open-ended exploratory questions were used to obtain data related to club managers/professionals' perceptions of bioterrorism. Interviews ranged in length from 20 minutes to one hour and all interviews followed the same set of probing open-ended questions. Interview data were coded to remove links to those being interviewed to ensure anonymity of responses and to maintain confidentiality of participants and their operations. Following the completion of the study, a debriefing form containing a summary of the major findings of the research study and confirmation of confidentiality of responses was offered to all study participants. Country club professionals interviewed were also offered a list of resources to address concerns shared during interviews.

Observations were conducted in all 25 country clubs. The observations of food biosecurity practices focused on the clubhouse or wherever the majority of food production occurred in all clubs. Observations focused on food defense practices, not individuals being observed; no individuals were identified when recording observation data. Data were aggregated so that specific locations observed remained anonymous. Any observations that revealed risks to an

operation (such as a breach in food safety, an operational problem, or a food biosecurity risk) were communicated to the club professional during the on-site observation.

Table 1: Private Club Biosecurity - Club Manager Interview Form

Section A Knowledge of National Restaurant Association (NRA) and Food and Drug Administration's (FDA) Resources

The following set of interview questions pertain to your knowledge of NRA and FDA resources pertaining to Food Biosecurity Defense.

1. Are you aware of the NRA publication "Food Security – An Introduction"?
2. If so, then how did you first become aware of this resource?
3. Are you familiar with the FDA's responsibilities in enforcing the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (the Bioterrorism Act)?
4. If so, then how did you first become aware of the NRA publication "Food Security – An Introduction"?
5. Are you aware of any other resources on food biosecurity applicable to country clubs or private clubs? If yes, please specify:
6. Do you feel that your country club is at risk for an intentional attack on your food production systems? (yes/no)
7. What areas of your operation do you think are the most vulnerable to an intentional attack from outsiders (non-employees)?
8. What areas of your operation do you think are the most vulnerable to an intentional attack from insiders (employees)?

Section B Resources Needed for Food Biosecurity Defense

The following set of interview questions were designed to measure needed resources.

1. What resources are needed to implement a Food Biosecurity Defense Plan in your club?
2. Facilities needs (i.e. storage, utility updates, equipment upgrades, grounds or building improvements)?
3. Employee needs (i.e. training, screening)?
4. Security needs (i.e. security devices, alarms, etc.)?
5. Please explain some perceived barriers to implementing a Food Biosecurity Defense Plan in your operation:

Section C Training Needs Related to Food Biosecurity Defense

The following set of interview questions are designed to measure your Training Needs for Food Biosecurity Defense. Please indicate the amount of training that is currently given in the following areas:

1. What type of training programs have you implemented in your club related to Food Biosecurity? (Start with broad based, probing questions. Broad categories would be: facility security, utility security, employee management, communication, food handling, chemical use and storage.)
2. What types of training needs would be essential in your club related to Food Biosecurity? (Begin to narrow focus – asking more specific questions).

Section D Policies and Procedures

The following set of interview questions are designed to measure policies and procedures.

1. To what extent do you already have policies and procedures developed that would overlap with/ indirectly address food biosecurity issues in your club (Crisis Management Plan, Disaster Management Plan)?

Data Analysis

Interview data were compiled and sorted by categories per the interview question. Data were also sorted by themes; factors included importance perceptions, perceived self-efficacy, barriers, and attitudes. Observation items were recorded as "yes," "no," or "not applicable." Observation data were analyzed with the Statistical Package for the Social Sciences (SPSS) version 19.0 (SPSS Inc., 2010). Frequencies and percentages were calculated for observation items.

RESULTS

Interviews

All club managers were asked if they thought that their country club was at risk for an intentional attack on their food production systems. Four club managers answered "yes" while the remaining 21 managers answered "no." Six club managers indicated that it was possible but not probable that an attack could occur and three club managers stated that the risk was lower in a private club setting than in a public setting. Nine club managers indicated that if someone really wanted to contaminate food that it would more likely be a disgruntled employee that did so (rather than a non-employee). Conversely, two club managers stated that it would be more likely that an outsider would contaminate food rather than a disgruntled employee.

Club managers were asked to identify areas of the club that were the most vulnerable to intentional attack from outsiders (non-employees). Fourteen managers indicated that vendors and/or delivery people would be able to exploit vulnerabilities in a club's food biosecurity due to the direct access they had to foodservice preparation areas in their club. These areas included the delivery dock and anywhere food was stored (storerooms, coolers, etc.). Since these areas are generally located in proximity to food production areas, the potential that a club's food production system would be vulnerable to delivery personnel is high. Six club managers stated that vendors could also potentially tamper with food before delivery. However, three club managers indicated that they trusted their vendors and that intentional contamination of food would not occur by the actions of a vendor or a delivery person. Six club managers stated that buffets, beverage service, condiment dispensers, and food served at wedding receptions, poolside areas, and corporate events could be vulnerable to contamination from other individuals granted public access to club premises. This included members, their guests (including former members and former club employees), and contractors.

Club managers also were asked to identify areas of the club that were the most vulnerable to intentional attack from insiders (employees). Sensitive areas of vulnerability identified where food was stored, produced, or served. Club managers were asked to identify resources such as facility, employee, and security needs to implement a food defense plan in their operations. For facility needs, fencing, more secure club design, and pass gates were the most commonly cited examples of improvements to a club's overall security. However, one manager indicated that while effective, installing pass gates would be problematic for club traffic. Other responses included locks on coolers and storage units, and a dedicated secure receiving area for all deliveries.

For employee needs, 16 club managers identified good employment practices (including background checks of all new potential employees) were needed to increase food defense. Regular staff meetings and training to increase awareness of overall club security (including food) was also mentioned. Seven managers stated the method used for training employees about food biosecurity should avoid presenting information that could result in negative behavior. Creating an environment of trust and identifying employees that are

Table 2 : Observed / Reported Food Security Items During Onsite Visit to Country Club Properties (n=25)

FOOD SECURITY ITEMS	OBSERVED / REPORTED		
	Yes	No	N/A
Exterior Premises & Outside Exits/Entrances of Country Club			
Parking lot for visitors & guests are at safe distance from CC.	17	8	
Outside lighting is adequate to detect unusual activities.	24	1	
Video surveillance monitoring is used.	11	14	
Gates/security checkpoints used to restrict access to club premises	6	19	
Fencing or other deterrents are used around sensitive areas (i.e. non-public perimeter and/or storage lockers, air intakes, etc.)	18	7	
Security patrols are present.	7	18	
Access limited to outside controls for airflow.	18	7	
Access limited to outside controls for water.	20	5	
Access limited to outside controls for electricity.	18	7	
Access limited to outside controls for refrigeration.	16	7	2
External facility signs are up-to-date and useful in maintaining control of premises.	6	19	
Dedicated public entrance(s) to clubhouse exists.	24	1	
Dedicated employee entrance(s) to clubhouse exists.	22	3	
All other non-dedicated clubhouse exits/entrances secured.	4	21	
Dedicated employee entrance to facility secured.	5	20	
Employee entrance has policy posted for entrance/exit guidelines.	1	24	
Outer doors are sturdy / reinforced (i.e. metal frame or equivalent).	25	0	
An authorized person is assigned to receive shipments during regular business hours.	23	2	
An authorized person is assigned to receive shipments after regular business hours.	5	20	
Daily schedule of deliveries is posted/available.	4	21	
List of approved suppliers is posted/available.	14	11	
Exterior Premises & Outside Exits/Entrances of Country Club			
Receiving logs are used and up-to-date.	4	21	
Receiving policies/procedures for food deliveries are posted/available.	13	12	
Receiving policies/procedures for chemical deliveries are posted/available.	13	12	
Receiving policies/procedures for MSDS sheets are posted/available.	20	5	
Guidelines for tamper-resistant verification are posted/available.	8	17	
Delivery trucks are kept locked when not being unloaded or loaded.	2	23	
Dedicated vehicles are secured at all times for transporting food produced in a centralized CC to satellite CC locations (pool/golf course).	12	10	
List of phone number of approved primary suppliers and alternative suppliers is posted/available.	22	3	
Dock doors are closed and locked when not in use.	9	16	
Clubhouse Storage Areas			
Access to all food product and food ingredients is secured.	15	10	
Access to chemical storage areas is secured.	14	11	
Only designated employees have access to storage rooms.	16	9	
Designated area for storing distressed, damaged, and returned products to ensure that they are not served or used in the operation.	19	6	
Accurate inventory of all supplies is readily available.	25	0	
Security alarm installed on storage room doors?	5	20	
Storage room doors reinforced and secure/tamper-proof?	20	5	
Clubhouse Foodservice / Food Preparation Areas			
Restricted foodservice areas are assigned and clearly marked with appropriate signs, including food and chemical storage areas.	3	22	
Leftover food items stored in sealed containers that are labeled/dated.	23	2	
Only designated employees have access to restricted foodservice areas.	20	5	
Key log is readily available and up-to-date to verify access to restricted foodservice areas.	12	12	1
Access to airflow is restricted and accessible only by designated employees.	19	6	
Access to HVAC is restricted and accessible only by designated employees.	21	4	
Access to water system is restricted and accessible only by designated employees.	20	5	
Access to electricity is restricted and accessible only by designated employees.	18	7	
Access to gas is restricted and accessible only by designated employees.	21	4	
Emergency exits (alarmed) are present per local, state, fire/building codes.	17	7	1
Self-locking doors (opened from the inside only) are present per local, state, fire/building codes.	17	7	1
Doors are secured (lock, seal, sensor device) at all times.	5	20	
Windows are secured (lock, seal, sensor device) at all times.	15	9	1
Roof openings are secured (lock, seal, sensor device) at all times.	16	6	3

Table 2 : Observed / Reported Food Security Items During Onsite Visit to Country Club Properties (n=25) (CONTINUED)

FOOD SECURITY ITEMS	OBSERVED / REPORTED		
	Yes	No	N/A
Clubhouse Foodservice / Food Preparation Areas (CONTINUED)			
Vent openings are secured (lock, seal, sensor device) at all times.	16	6	3
Outside refrigeration are secured (lock, seal, sensor device) at all times.	6	7	12
Outside storage units are secured (lock, seal, sensor device) at all times.	4	7	14
At least one authorized employee is present in the foodservice area at all times when the area is not secure.	21	4	
Alternative storage place (outside of foodservice areas) exists for employees to secure personal foods and medications.	18	6	1
Documentation exists describing where ingredients and foods are stored and prepared in the CC.	5	20	
Self-service foodservice areas are monitored.	17	5	3
All leftover items are stored in sealed, labeled, and dated containers.	25	0	
Food or ingredients not properly sealed and labeled is discarded.	24	1	
Purchase records are available.	25	0	
Food production records are available.	7	18	
HACCP records are available (if applicable).	4	21	
Temperature logs are available.	11	14	
Map or diagram defining boundaries of all foodservice areas & locations of specific foodservice activities is available.	3	22	
Clubhouse Hazardous Chemicals			
Chemical storage area is outside of food preparation areas.	24	1	
Chemical storage area is secured.	12	13	
Chemical storage area is accessible only by designated employees.	15	10	
Manufacturer's instructions for use of hazardous chemicals are available, including instructions for amounts of chemicals to use, personal protective equipment guidelines, and guidelines for optimal environmental conditions for use of chemicals.	25	0	
Daily inventory of hazardous chemicals is available (should contain a chemical inventory and usage log).	1	24	
Material Safety Data Sheets (MSDS) for hazardous chemicals are readily available.	24	1	
Containers used to transport chemicals from the storage area to the work area are properly labeled.	22	2	1
Clubhouse Foodservice Equipment			
Access to foodservice equipment is secured. Only designated employees are allowed to operate and maintain/clean equipment.	22	3	
Signs and/or instructions are posted to increase safety especially with potentially dangerous equipment (meat slicer, mixers, steamers).	7	18	
Clubhouse Foodservice Personnel			
Updated daily or shift roster of foodservice personnel is available to foodservice supervisors.	24	1	
Employees are easily identifiable (ID badge).	7	18	
Temporary workers, contractors, cleaning crews, construction workers, truck drivers, etc. are clearly identified.	10	14	1
Only authorized individuals in restricted sections of foodservice area.	22	3	
Clubhouse Water and Ice Supply			
Water supply is secured against outside access.	21	4	
Ice-making equipment are secured against outside access.	17	8	
Backflow devices are in place on all water-supply equipment.	25	0	
Clubhouse General Security			
Computer systems have effective, up-to-date firewalls and virus detection systems.	24	1	
Computer systems files are backed up regularly.	20	5	
Sign-in desk or other designated area for visitors and non-club employees to explain purpose of their visit.	7	18	
I.D. badges issued to visitors.	25	0	
Escort/Security personnel at public entrances.	5	20	
Written program in place specifying how access to keys, keycards, and number codes/PINs are granted and denied to employees.	7	18	
Adequate interior lighting.	25	0	
Adequate emergency lighting to facilitate detection of suspicious or unusual activity.	24	1	
Minimal number of places in non-public areas exist that an intruder could remain unseen after work hours (e.g. trash dumpster areas).	3	22	
Minimal number of places in non-public areas exist that could be used to temporarily hide intentional contaminants.	2	23	
Inspection of incoming and outgoing packages and briefcases.	2	23	
Duress alarms installed in refrigerators and freezers.	11	14	
Access to roof & roof equipment under control?	20	5	
Access to food product (i.e. to the interior) from roof under control?	20	5	
Employee lockers monitored/inspected?	3	18	4

problematic, unhappy, or exhibiting unusual behaviors also are important. Fair and dignified progressive disciplinary procedures were mentioned as a way to curtail disgruntled employees. Hiring a dedicated purchasing agent who oversees the procurement and inspection of all goods also was identified as an effective employment strategy to increase food defense. Six managers recommended having and enforcing an operational policy that required at least two people to be in food production areas at all times (to keep an eye on one another).

For security needs, club managers were supportive of having closed circuit television (CCTV) surveillance systems installed for monitoring activity in their club. Eleven clubs already had video cameras installed, but their value as a deterrent was questioned. Five club managers indicated that someone committed to intentionally contaminating a club's food supply would do so regardless of video cameras being in place. In addition, an employee would be needed to observe the security tapes; this practice was viewed by managers as not being cost-effective. Fifteen club managers stated that for video surveillance to truly be effective, it would need to be club-wide. Finally, the feasibility of installing video cameras in coolers, privacy issues in locker rooms, and the usefulness of monitoring seldom-trafficked areas (in addition to club members' acceptance of CCTV) were also questioned.

When asked about perceived barriers to implementing a food defense plan, 16 club managers stated that the cost was the biggest issue. Six club managers were not convinced of a sufficient enough threat to their country club to warrant the expense of implementing food defense strategies. The time required to implement a food biosecurity management plan or to continually train employees also was identified as a barrier by six club managers. Apathy, lack of need, and staff resistance were mentioned as potential barriers. Low motivation to implement new changes (unless a food biosecurity issue arose) was identified as a barrier. Suggestions to improve motivation were to issue CMAA education credits to club managers who implemented food biosecurity management plans or to require (by law) that clubs have such plans in place. Board of directors' approval and the quality of member/employee life (e.g. excessive surveillance) also were identified as barriers to implementing a food biosecurity management plan.

Training programs already in place pertaining to club security included procurement procedures, pilferage and inventory control, food safety/sanitation training, chemical handling, grounds security training, and CPR/defibrillator training. Training needs identified as essential to club operations to increase food biosecurity included the following topics: financial implementation of food defense plans, specific training on the topic for management staff, service employees, vendors, training employees to use an anonymous hotline (whistleblower) and OSHA compliance. Further recommendations include awareness training, having written training materials in place, and training to prevent anything else that has the potential to harm a club member.

Club managers were asked to what extent they already had policies and procedures developed that would overlap with or indirectly address food biosecurity issues. Fifteen club managers indicated they had no disaster management plan in place. Twelve club managers stated that they had some policies and procedures in place, such as CPR training, chemical handling procedures, and informal disaster management procedures (e.g. calling 911). Only four club managers had formal disaster management plans in place which detailed specific actions to take in the event of an emergency in their club.

Themes Identified in Interviews

Club managers' input was valuable in identifying themes regarding food defense from their perspective. During the interviews, managers freely offered their opinions of food biosecurity issues in country clubs. At the close of each interview, club managers were explicitly asked if they had any additional information to provide, including any constructive criticism or their "gut feelings" about the subject matter. What follows is a compilation of club managers' responses (in their own words) grouped into common themes.

Importance perceptions

Importance perceptions regarding food biosecurity included responses such as "this is a very important topic" and "it should be a higher priority than it currently is." Other responses were "you should not be naïve about food biosecurity – it should be on a club manager's radar" and "if implementing food biosecurity management procedures prevents even one incident from happening, then it's worth the investment." Some club managers did not perceive food biosecurity to be as important as others did. Comments included "this is not as important as other areas to focus your resources" and "you shouldn't make a mountain out of a molehill if you don't have to."

Perceived self-efficacy

Club professionals' perceived self-efficacy is their belief in their own capabilities to plan and implement necessary actions to effectively deal with events in their country club. Club managers' responses showed varying degrees of self-efficacy while describing food terrorism issues. Responses of lower self-efficacy levels included "unless you catch them red-handed, they will be hard to catch" and "if someone wanted to do it, they could." Conversely, responses indicating higher levels of self-efficacy were "if this ever became a true issue in my club, I would eliminate food and beverage service altogether," and "I could do this. If I told the board (that we should create a food defense management plan) they would say it was a good idea."

Barriers

Club managers described potential barriers that could either impede implementing food biosecurity in country clubs or affect club operations in general. These included "this (food defense) gets in the way of employees doing their job" and "the lack of need (of food defense management) would be the biggest barrier." Some club managers indicated that there were factors in their clubs that could possibly reduce barriers to food biosecurity issues. Comments included "every item purchased by our club comes through one door and is inspected by one person – our purchasing agent" and "besides the local hospital, we have the highest concentration of doctors under one roof in town."

Attitudes

Club managers' attitudes varied regarding food biosecurity. Attitudes supportive of food biosecurity included "the benefits of training outweigh the risks – it is incumbent of managers to take steps to maintain security and act upon the risks and take precautions" and "there should be mandatory (food defense) certification and it should be posted on the front door." Attitudes less supportive of food biosecurity were "if you were to try to address this issue, you would risk someone copycatting or mimicking it – it would appear as if you were 'professing' food terrorism" and "in my 25 years as a club manager, I've only heard of two incidents of intentional food contamination, and neither of them occurred in a club."

Observations

Following interviews, observations were conducted at each private country club visited. For items that were directly observable (e.g. if entrance guidelines were posted by the employee entrance), the

researcher recorded the results. For items that were not directly observable (e.g. if a key log was readily available), the researcher queried club professionals for the answer. The observation results are presented in Table 2.

Exterior premises

Upon arrival at each country club, the researcher examined the exterior of the country club. Nineteen country clubs observed did not have a dedicated front gate to limit vehicle access into the country club. Security patrols were present in only seven clubs visited. The majority (19) of clubs did not have signs that helped maintain control of the premises. Access was limited to outside controls for utilities, including airflow (18), water (20), and electricity (18). All but one club had a dedicated public entrance to the clubhouse and 22 clubs had a dedicated employee entrance. However, only one employee entrance had formal entrance/exit guidelines posted and only four were considered secure. Most clubs had an authorized person assigned to receive shipments during regular business hours (23), however, dock doors in 16 clubs were usually not closed and locked when not in use.

Storage areas

All 25 clubs indicated that they could take accurate inventory anytime. Storage doors were tamper proof in 20 clubs. However, 10 clubs stated that access to food product was not secured and 12 clubs indicated that access to chemicals was also not secure.

Foodservice / Food preparation areas

Only three clubs restricted access to foodservice areas via signage and only five had doors secured at all times. All but four clubs had at least one authorized employee in the foodservice area at all times and 20 restricted access points to foodservice areas to only designated employees. Five clubs indicated that they possessed documentation describing where ingredients and foods were stored and prepared in their country club.

Hazardous chemicals

Chemicals were stored outside of food preparation areas in all but one of the clubs observed but less than half (12) of the chemical storage areas were secured. Only one club took a daily inventory of chemicals and all but two clubs labeled their chemicals (e.g. spray bottles filled from bulk containers).

Foodservice equipment

Access to foodservice equipment was secured in 22 clubs, with only designated employees allowed to operate and/or clean equipment. There was a lack of signs or instructions posted to increase safety with potentially dangerous equipment in the majority of clubs (18). Supervisors indicated that the operation of equipment was a part of an employee's training.

Foodservice personnel

An updated shift roster was available in all but one club; however, employees were not clearly identifiable in 18 clubs (no identification badge or nameplate). In addition, only 10 clubs stated that they clearly identified temporary workers.

Water and ice supply

As required by law, backflow devices were observed in all clubs' water-supply equipment. Access to the water supply was considered to be safe in 21 clubs. Ice machines were secure in only 17 clubs.

Clubhouse general security

The majority of clubs kept their firewalls and virus detection systems up to date (24), and backed up system files regularly (20). No club

issued identification badges to visitors and only seven had sign in desks (7) for visitors.

DISCUSSION

Suggestions for Improving Food Defense in Country Clubs

According to Howe (2004), clubs have long been analogized as "safe havens and homes-away-from-home for their members; a place of comfort and security." Only four club managers thought that their country club was at risk for an intentional attack on their food production systems. Sixteen club managers indicated that cost was the primary barrier to implementing a food defense management plan. Furthermore, 15 clubs had no disaster management plan in place. Given the low perceived risk of food biosecurity, the high perceived cost, and the lack of formal disaster management plans in place at the majority of country clubs visited, it is recommended to implement economical improvements to overall club security that overlap with food biosecurity issues.

Security measures most often utilized in country clubs include gates and fences (Macklin, 2004). Following September 11th, 2001, U.S. country clubs implemented stronger security protocols, by installing more guard gates and increasing the use of security personnel (Howe, 2004). This could also include securing exterior doors that are used infrequently and installing locks on all storage areas. A key control program could be implemented that specifies how keys are issued, revoked, and under what circumstances keys and lock should be changed. Accountability for either metal key or electronic access control systems "is paramount" (Clifton, 2012). Establishing a "backdoor" policy specifying how deliveries are handled and access is granted into sensitive club areas could also improve overall club security.

Criminal background checks are relatively low-cost insurance to screen applicants before hiring. Sixteen club managers indicated background checks of all new employees were important to increasing food defense. Several club managers stated that a disgruntled employee would be more likely to intentionally contaminate food than a non-employee. It is specifically recommended for country clubs to consistently conduct background checks on all potential employees (Clifton, 2012).

Closed circuit television (CCTV) is the most common surveillance equipment used in country clubs (Macklin, 2004). Fifteen club managers recommended club-wide video surveillance as an effective security measure. Although cost could be an issue, video cameras could be installed as a general security procedure and as a deterrent against pilferage. "Dummy" (nonfunctional) video cameras can serve as an inexpensive alternative to functioning video cameras and as a psychological deterrent to bioterrorists even though images are not actually recorded. However, dummy cameras may provide a false sense of security and legal counsel should be consulted before choosing to install them (Clifton, 2012). Resistance from club members can also be an issue when installing video surveillance (functioning or not), especially in sensitive areas such as locker rooms. However, given the fact that 21 clubs could be entered through doors other than the dedicated public entrances, video surveillance is highly recommended for country clubs.

Chemicals are of primary concern in food defense management, thus it is recommended that chemical storage areas be secured throughout clubs. Access to chemicals was not secured in 12 clubs visited. Chemicals are also costly, so securing access to them could reduce pilferage, while increasing food biosecurity. Pool chemicals (commonly used in country clubs) should be stored securely and away from guests and would-be bioterrorists (Clifton, 2012).

It is recommended that club managers appoint dedicated purchasing agents and to route deliveries to one primary delivery area in their clubs. An authorized person was available to receive shipments in 23 clubs observed. This meant that for every delivery made to various locations in the club, an authorized individual accepted delivery. Only one club visited had a dedicated purchasing agent that was solely responsible for inspecting all club deliveries. Access granted to areas past the delivery area (such as coolers and storage areas) should be regulated and granted only to trusted delivery personnel. In addition, club access should also be monitored for anyone else who is not a member or an employee of the club (e.g. contractors). The perceived cost of hiring a purchasing agent could be justified by lower pilferage, spoilage, and savings from improved purchasing practices, while improving food defense practices.

Clear identification of all club employees is recommended. This includes temporary workers and back-of-the-house workers who do not normally come into contact with members. Eighteen clubs did not clearly identify their employees using nameplates or identification badges. A timely issuance of identification badges or nameplates would ensure that workers are always identified, even on their first day of employment. Terminated employees should be required to return their identification badges before receiving their last check. In addition, 18 clubs did not have sign-in desks and were easily entered unnoticed through the front entrance. It is recommended to have a dedicated greeter or sign-in desk at the front entrance of clubs to welcome every visitor.

Fifteen clubs had no disaster management plan in place. Disaster management plans help prepare clubs for disasters before they occur, detail the responses to take in the event of a disaster, and help support rebuilding after a disaster occurs. It is strongly recommended that clubs develop formal written procedures to deal with issues such as fire, flood, lightning, evacuation, and food defense procedures. For example, a calling tree is a telephone procedure or automated software which can be used to notify staff promptly of an emergency. This can help expedite emergency response to various club disasters, including bioterrorism.

Limitations of the Study

The field study conducted observations and interviews in 25 clubs over a four month time period. During the course of the data collection, potential limitations in data collection and analysis were identified. These included:

1. The researcher's observations focused primarily on the main clubhouse, or wherever the majority of food production occurred. Even though the country club segment was selected to help standardize observations and interviews, country club facilities varied slightly from club to club.
2. Of the 25 club managers interviewed, 24 were male and one was female. This may or may not have contributed to sex bias in the interviews.
3. Data collection can present challenges if the club professionals are too busy to complete surveys or schedule interviews. Following Memorial Day, persuading club managers to participate in data collection was challenging due to increased summer activities (pool, tennis, golf, etc.).
4. Although this study added to the existing body of literature on bioterrorism in foodservice operations, results cannot be generalized and applied to settings other than country clubs.
5. Due to the serious nature of the research topic, club professionals may have been resistant or reluctant to share weaknesses of their club's readiness to protect their members from harm.

6. Due to time and cost considerations, only 25 country clubs were visited. Only clubs in the Midwestern region of the United States were visited, limiting the ability to generalize results to the United States or beyond.
7. This study only focused upon country clubs whose managers were members of Club Managers Association of America (CMAA). It is unclear if there would be any significant differences with clubs whose managers were not CMAA members.
8. Observations and interviews took place primarily in the off-season. The time the data were collected could have influenced the outcome or access to several club managers and their clubs.

CONCLUSIONS AND APPLICATIONS

Within the hospitality foodservice literature, there is a dearth of research on food defense practices. This study attempted to identify country club operation areas that could be at potential risk of a bioterrorist attack due to current operational practices. Recommendations for managers of country clubs were identified and were based on results of the interviews and observations.

Club managers were initially unfamiliar with the topic of bioterrorism and few were convinced that their clubs were at risk for an intentional attack on their foodservice operations. Most country clubs were easily entered with little or no questioning from staff of the purpose of the investigator's visit. This suggests that better monitoring of club visitors is needed. Barriers identified by club managers in implementing improvements to food biosecurity were mainly cost/benefit related. As most club managers did not perceive their clubs to be at risk, they felt that the cost to implement food defense practices outweighed the benefits.

Future research recommendations are to gather more baseline data from club managers across the United States. This could include studying if there were any differences between club managers who were members of CMAA and those who were not. It would be interesting to assess if the same preventive food biosecurity practices would be more accepted if they were framed in the context of overall club security and controlling pilferage. As this topic has now been studied in hospitals, schools, and country clubs, further research in additional onsite or commercial foodservice operations could be useful.

Risk perceptions also could be explored in future research. Although the perceptions in this study were that the risk of food bioterrorism in country clubs is low, having a formal food defense management plan in place is better than assuming that no one will commit a bioterrorist attack on a country club's foodservice operation.

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