

## A Personal Hygiene Behavioral Change Study at a Midwestern Cheese Production Plant

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### ABSTRACT

High rates of employee turnover create training challenges as well as increase the risk of food-borne illness outbreaks and food product recalls. As a result, managers need tools to help them develop effective methods to rapidly and effectively train their employees. In addition, they need to combine this training with their observations and coaching to improve individual employee's performance. This case study documents the implementation of a closed loop process of training combined with observations and continual feedback to improve employee behavior.

**Keywords:** Food Safety Training, Identifying Behaviors, Observations, Continual Improvement

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### INTRODUCTION

Even after decades of research, increased emphasis in FDA's Model Food Code and increased spending on food safety, there has not been a significant decrease in food-borne illness outbreaks or food product recalls. According to the United States (U.S.) Food and Drug Administration (FDA) website, there were over 160 food product recalls in 2013 for contamination from both pathogenic microorganisms and physical hazards. These microbial pathogens included *Listeria monocytogenes*, *Escherichia coli*

O157:H7, *Salmonella*, and Norovirus (FDA, 2013). Food-borne illness continues to increase as a health concern in the United States and throughout the world. According to the Centers for Disease Control and Prevention (CDC), 1 in 6 U.S. citizens gets sick each year from food-borne illness (CDC, 2001). In addition, over 128,000 persons are hospitalized and approximately 3,000 die from food borne illness (Scallan, Hoekstra, Angulo, Tauxe, Widdowson, Roy, Jones and Griffin, 2011).

The United States (U.S.) Code of Federal Regulations (CFR) Title 21 Section 110.10 describes employee health and hygiene practices within the context of Good Manufacturing Practices (GMP's) and the steps

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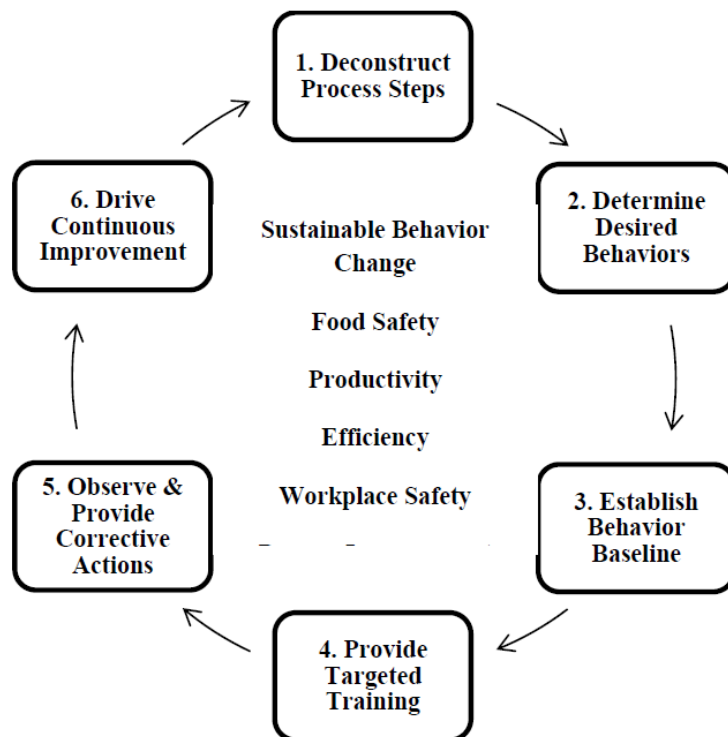
necessary to prepare foods for human consumption. The Code clearly states that the management team of food processing plants must take responsible measures and precautions to ensure the following:

- Exclusion of ill employees from working who pose a risk of contamination of food products, food contact surfaces or food packing materials,
- Cleanliness of employees which includes wearing clean garments to protect food, maintaining adequate personal cleanliness,
- Proper hand washing,
- Removal of all jewelry,
- Glove maintenance,
- Effective hair restraints,
- Proper storage of employee belongings,
- Control of eating, drinking, chewing gum or using tobacco in appropriate locations and
- Most importantly, education and continual training of employees (21 CFR 110.10).

Food handlers can be a source of food contamination by microbial pathogens. Any employees who report to work having the symptoms of food-borne illness such as vomiting and/or diarrhea, pose a threat of contamination of food products or food contact surfaces and should not be permitted to work in contact with food. In addition, infected employees can unintentionally spread disease to other workers if they do not follow proper hygiene practices.

A new approach to food safety training is called for because increased emphasis and training on personal hygiene have not resulted in a significant decrease in food recalls and food-borne illness outbreaks. One such approach is a “Closed-Loop” for effective training, combined with supervisory observations and coaching to improve performance (Figure 1).

Figure 1. Closed Loop for Effective Training for Employee Improvement.



This model consists of the following six steps:

1. Breaking down a specific process into a sequence of smaller process or steps.
2. Determining the desired employee action/behavior at each step and identifying potential deficiencies.
3. Observing, measuring and documenting baseline level of employee behavior compliance following current training practices
4. Training front-line employees on what constitutes acceptable behaviors.
5. Empowering supervisors to make corrective observations of individual employees. Corrective actions should be non-judgmental and non-punitive in order to focus on continual employee improvements.
6. Repeating the process on a sustained basis to validate an employee's improvements.

Management should establish proper training procedures for all new employees and conduct periodic retraining sessions to ensure all employees continue to use proper hand hygiene and food handling practices. The importance of Step 4: Training Front-Line Employees cannot be stressed enough. There are multiple products and training materials available, both in a classroom setting as well as on-line training. Management should take into consideration the learning styles of their employees which include auditory, kinesthetic and visual. One product that is currently available that utilizes all three learning styles is the SISTEM® approach which was developed by Alchemy Systems™ (<http://www.alchemy-systems.com/>). The SISTEM pedagogy is based on significant visual metaphors to help hold trainees' attention, learning modules that last no more than 20 minutes, interactive involvement, group activities and workplace training that is directly related to workplace experiences.

The current case study describes the implementation of a personal hygiene program using such an approach at a cheese processing plant.

## IMPLEMENTATION

This case study took place at a Midwestern cheese production facility and involved front line production workers and front line supervisors. The plant produces a variety of cheeses including kosher cheese, and the recipes are kept as trade secrets. The cheese is mostly distributed throughout the Midwest, but some wholesale customers are large chains that distribute to other areas of the country. Security in the plant is good. The plant has good written general management practices for personal hygiene but had inconsistent results in terms of their execution by employees before the SISTEM training.

The plant environment is as a separate, for-profit organization that resides within a not-for-profit religious community. One of the missions that the religious community focuses on is an 18-month long rehabilitation program for people who have had numerous types of difficulties in their lives. The community is self-contained; that is, it includes schools, a restaurant, grocery and other shopping, housing and transportation.

Amanda Green and Steven Nguyen (not their real names) are front line supervisors who have successfully completed the 18-month rehabilitation program and then stayed on to take supervisory positions within the production facility. The plant is relatively small with approximately 30 employees working all positions and all shifts at any one time. This requires Amanda, Steven and the employees to constantly "wear many different hats." One day a supervisor may be supervising production; the next day they may have to drive a milk truck because the regular driver is absent. Given the nature of the workforce, absenteeism is low but turnover is high due to ongoing personal issues of these persons undergoing rehabilitation.

## TRAINING DESIGN

Amanda and Steven are very committed to the cheese factory and the employees who are trying to make positive changes in their lives. Amanda and

Steven realize that they need to make changes to ensure the safety and quality of the cheese they produce. They have asked the Rehabilitation Center's Board of Directors for additional resources, and after the Director's approval, they developed a Personal Hygiene Program for the Cheese Plant. One of the Board of Directors, a retired commercial food processor, offered to help Amanda and Steven with their assignment and gave them the following outline:

- Determine what behaviors if changed would have the most positive impact on the business. (Personal hygiene was overwhelmingly selected.)
- Define the specific personal hygiene behaviors needed to be included in the additional training. (Hand Washing, Entry/Exit, Sickness/Cuts/Abrasions, General Personal Hygiene, Clothing/Jewelry and Visitors were identified.)
- Determine how to measure the behaviors. (A deficiency system)
- What type of initial training needed to be provided? (He recommended Alchemy's SISTEM-Diary Library, starting with their Basic Hand Washing learning module)
- What process(s) support training? (Corrective Observation Process)
- What is the sequence of the behavioral change process? (Set mile markers for evaluation and measurement of change.)
- Set baseline for each behavior.

Amanda and Steven decided that the first step would be for them to observe the current personal hygiene practices of their employees. The next step would be for all employees to receive personal hygiene training using the Alchemy's SISTEM- Diary Library for hand washing. Next, they would observe and measure employee-hand washing behaviors. Amanda and Steven would then give individual feedback or implement interventions when they discovered discrepancies between the desired behavior and what they just observed. Results were tracked and reported to management.

Amanda and Steven quickly became effective

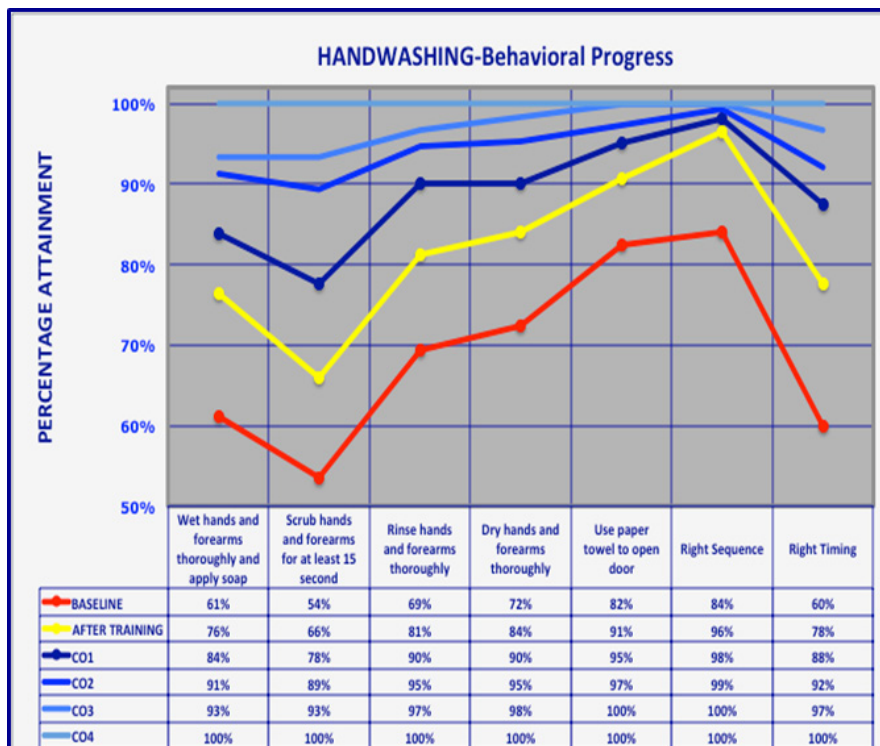
subject matter experts (SME's) in personal hygiene and learned to effectively coach their employees through the corrective observation process. The supervisors learned to measure employee behavior in a consistent manner. Most of the training was conducted in small groups of two or three employees. On average the SME's spent about 3 hours each week auditing all of the behaviors and people who were part of the study. They did not feel that the auditing negatively impacted their work schedule because they spent most of their time observing the employees during the cheese production process as part of their regular job. The only additional task was documenting deficiencies as they were identified. However, there were a number of difficulties that arose. The main one was very high employee turnover due to the nature of the plant operating within a rehabilitation program. Many employees would get a baseline measurement and take the training and then have a personal crisis that caused them to leave before long-term changes in behavior could be documented.

## HAND WASHING

The results for the hand washing behaviors are summarized in Figure 2. The hand washing behaviors measured were: wet hands and forearms, scrub hands and forearms, rinse hands and forearms, dry hands and forearms, use paper towel to open door, do the process in the proper sequence and wash hands at the right time.

The red line on Figure 2 represents the base line (percentage attainment) for all of the hand washing behaviors for all employees that were part of the program. Note that the baseline measurement was taken before SISTEM training was administered. The yellow line represents the level of performance attainment after the initial training had taken place. Note the improvement in level of attainment between the red line (baseline) and yellow line (training intervention). The average level of performance across all hand washing behaviors at the baseline was 68%. That is, the performance was 68% of the

Figure 2. Hand washing data for employees at a cheese manufacturing plant before and after training



employee performing the behavior exactly right. After training was administered but before any corrective observation process, the average level of correct performance of proper hand washing was 82%. From the average performance level at the baseline of 68% after training and 4 corrective observations all of the employees' hand washing behaviors were measured at the 100% compliance level. The corrective observation process alone accounted for an 18% improvement in employees correctly performing hand washing. Individual behaviors such as wetting hands and forearms and scrubbing hands and forearms exhibited more dramatic results. For example, the wetting hands and forearms behavior training alone accounted for a 15% increase in behavior, and the overall process of training and corrective observation accounted for a 39% improvement in behavior. Throughout the process some individuals temporarily regressed on their individual behavioral performance, but all at the end made significant improvement.

## THE NEXT STEP: PERSONAL HYGIENE

Amanda and Steven identified the following personal hygiene deficiencies:

Keeping good personal hygiene in all food processing areas

1. Smoking in a food processing area
2. Chewing tobacco in a food processing area
3. Eating in a food processing area
4. Drinking in a food processing area
5. Chewing gum in a food processing area
6. Touching a cell phone in a food processing area
7. Touching keys in a food processing area
8. Not being clean shaven or not wearing a beard net in a food processing area
9. Spitting in a food processing area
10. Blowing nose in a food processing area
11. Picking nose in a food processing area
12. Wearing false fingernails or fingernail polish when handling food

## DISCUSSION QUESTIONS

- Select one of the behaviors (from the letters “a” through “l”) in the list above. How would you advise Amanda and Steven to break down the selected behaviors similar to the way they broke down the hand washing practices shown above?
- Behaviors can be credibly measured on a consistent basis. How would you measure these behaviors on each part of the behavior you selected?
- Employees appreciate and want to be involved in the process. How would you include employees and encourage them to participate in the training and improvement program for the behavior selected?
- Turnover and absenteeism can cause a lot of stress in a work environment. How would you investigate the reasons why the turnover of employees remains high? What negative impact is there on employees having to “change hats” to do the work of absentee workers?
- There should be an intrinsic change in the “culture” of the employees at this work place. Improving sanitary conditions is important; but the desire to “own” the work they do at any work place is more important for the employees as well as the employer—irrespective of being profit or non-profit organization. How would you suggest changing the culture of this organization?

Although initially effective, a pencil and paper process to record observations is typically not easily sustainable. The process needs to be operationalized through technology that minimizes the supervisors’ time commitment and produces records that can reinforce the employees’ accomplishments. What technology could be utilized to ease the process?

- Identify Apps that may be used for monitoring.
- Identify websites or companies that provide these services.

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## TEACHING NOTES

This case study discusses the implementation of a personal hygiene program by breaking processes down into specific behaviors and how to observe, monitor and measure the employees’ compliance with the desired behaviors. It permits students the opportunity to think through the various behaviors as well as ways to communicate them to employees.

## TEACHING OBJECTIVES

This case study offers a unique perspective of a for-profit operation working within a not-for-profit structure. This scenario is not a traditional food processing facility; however, students may find themselves either supervising either of these types of operations or inspecting them in a regulatory or third party auditor situation. The following discussion topics are provided as a guideline to generate a deeper understanding of this case study.

- Discuss employee turnover.
- List some of the negative effects of high turnover with employees and/or, supervisors.

- What suggestions would you offer for improvements in the hiring process and documentation of proper initial training and follow up
- List ideas for Increasing Quality Assurance
- Where can you find additional information when beginning the process of Establishing Quality Assurance Standard Operating Procedures (SOPs)
- Write an outline of the steps in developing critical limits for the behavior you need to see changed
- What steps will Reduce Risk of Food Borne Illness Outbreaks
- Identify key behaviors to monitor, creating steps, monitoring protocols and record keeping

## TEACHING STRATEGY

This unique case study has been developed to challenge undergraduate and graduate students pursuing careers in quality assurance, food safety, food science and technology. Students should be encouraged to take holistic systems approach when addressing these challenges. To enhance the learning experience, students may be encouraged to work in teams or role play to represent the various groups represented in the case. Other variables to consider within the case may include communication barriers, including language barriers, differences between shifts (morning crew vs. evening crew), proper glove use, how frequently should hands be washed, and how many hand washing stations should be available within the facilities. This case study is intended to facilitate a realistic conversation and exercise in food production problem solving.