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Behavioral Change Study at a Western Soup Production Plant

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ABSTRACT

The food processing industry bears major responsibility and liability for ensuring the safety of commercially available food products. Effective employee training in food safety is a critical element in meeting those responsibilities. More and more workers in food processing plants do not use English as their primary language, making training and corrective actions more complex. The case study presented here reports on a training and corrective action study performed in a food processing plant where the predominant language was Spanish and where most training was performed in Spanish.

Keywords: Employee training, non-English language speakers, NES, food safety training, behavior modification

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INTRODUCTION

According to recent information regarding foodborne illnesses, foodborne diseases caused by known and unknown pathogens total 47.8 million illnesses, 127,839 hospitalizations, and 3,037 deaths annually in the United States (U.S.) (Scallan *et al.*, 2011). While much of the responsibility for preventing consumers' foodborne illnesses and deaths lies in safe food handling in the home (Marsden, 2009), the food processing industry bears a major responsibility and liability for ensuring safety of commercially available food products. As the numbers of non-English speaking (NES) laborers employed in food manufacturing plants continues to grow, the challenge of culturally appropriate training these individuals in safe food handling behaviors also grows (Po *et al.*, 2011). Documenting effective employee training in food safety is a critical element in meeting that responsibility and is required by recent regulations. This point was reinforced by the Washington law firm of Kelley, Drye and Warren: "The expansion of FDA authority in these areas (including documenting employee training) is expected to increase the odds that regulatory compliance and product safety missteps will be exposed and result in adverse FDA findings, enforcement, publicity, litigation, and related liability." (http://www.alchemy-systems.com/files/9513/3910/3431/ALC_WhitePaper_FSMA_1.6.pdf)

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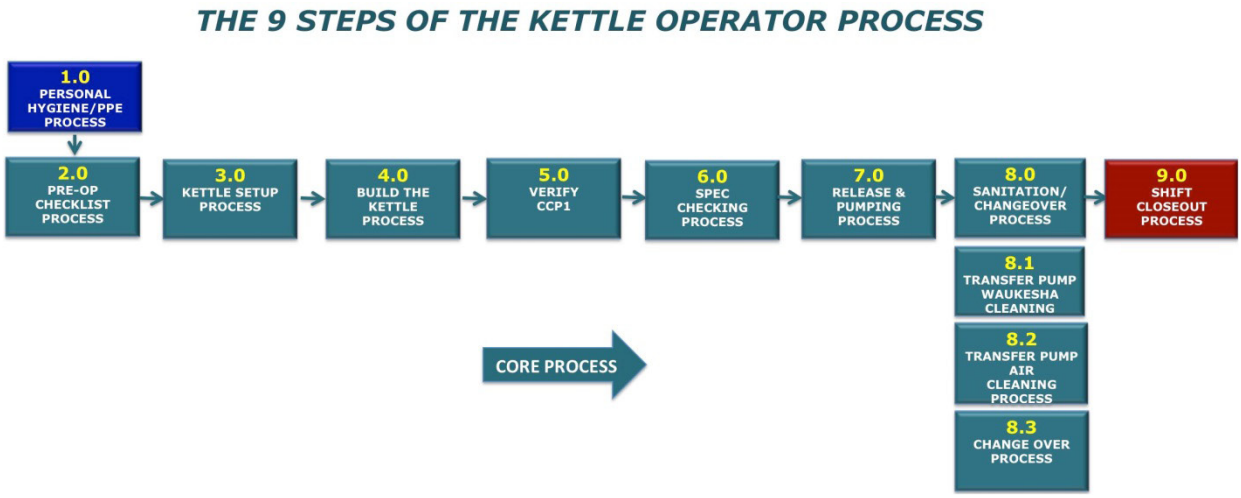
Figure 1. The kettle operator process in a Western soup and sauce plant.



Employee training programs must emphasize the importance of safe food, implement effective manufacturing practices, and enforce Standard Sanitary Operating Procedures (SSOPs) in the plants so as to provide safe and wholesome finished products (Mikel *et al.*, 2002). Food processors must continue to develop and improve the methods they use to produce safe foods (Jol *et al.*, 2006); however, it is difficult to teach employees about food handling techniques as prescribed in the Current Good Manufacturing Practices (CGMP; FDA, 2013) when workers' native language is not used, such as for Spanish-speaking laborers in an English-speaking work environment (Nyachuba, 2008). Employee education programs must be designed using proven educational methods and adapted to meet the needs of the diverse cultures comprising today's work force. Attention must be given to the communication skills and educational levels of all employees, including the growing non-English speaking population employed in many food plants.

The case study reported here took place at a West Coast food production facility involving front line production workers and front line supervisors. The study was designed to evaluate a methodology for sustainably changing the behaviors of front line workers regarding the in-process hygiene of a kettle operation in this plant that produces soups and sauces. The plant is located in a small town where the workforce is mostly Hispanic.

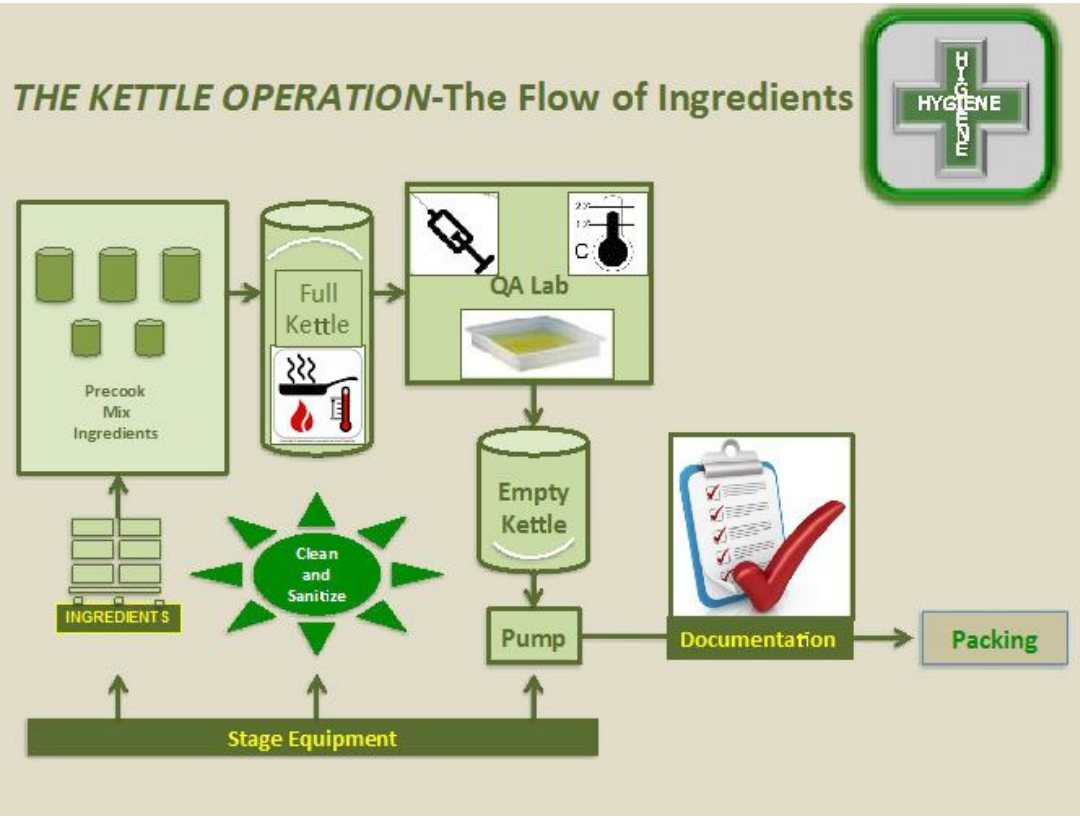
SCOPE OF THE STUDY

An executive team from the soup company composed of safety, food safety and training experts was gathered to determine the focus of the employee training study. After discussion and a few facilitative exercises, the group decided that the main focus should be in-process hygiene of their kettle operation. It was determined that the impact of the chosen process would be of great business benefit to the company.

The plant already had Alchemy training fully implemented and in place (see Neal *et al.*, A Personal Hygiene Behavioral Change Study at a Midwestern Cheese Production Plant in this same issue for an explanation of the Alchemy training system). Before initiating this study, management ensured that each of the workers had been trained in general hygiene processes and some company specific training in the area of kettle hygiene.

The training consultant worked, in conjunction with the plant manager and the quality management team at the plant, to determine that the study would encompass the operation of the first shift of the kettle operation. The study was designed to include the full kettle operation from the gathering of ingredients to the final cleaning and sanitation of the kettle, inlet and final product exit piping.

Figure 2. The kettle operator process in a Western soup and sauce plant.



TRAINING DESIGN

The study at the soup and sauce processing plant had the following goals:

A. To develop a documented system for specific, sustained behavioral change of front line workers for all of the hygiene processes for the making soups and sauces in the kettle operation.

B. To train supervisors to become skilled at corrective observation, coaching and to become subject matter experts for all hygiene behaviors related to kettle operations.

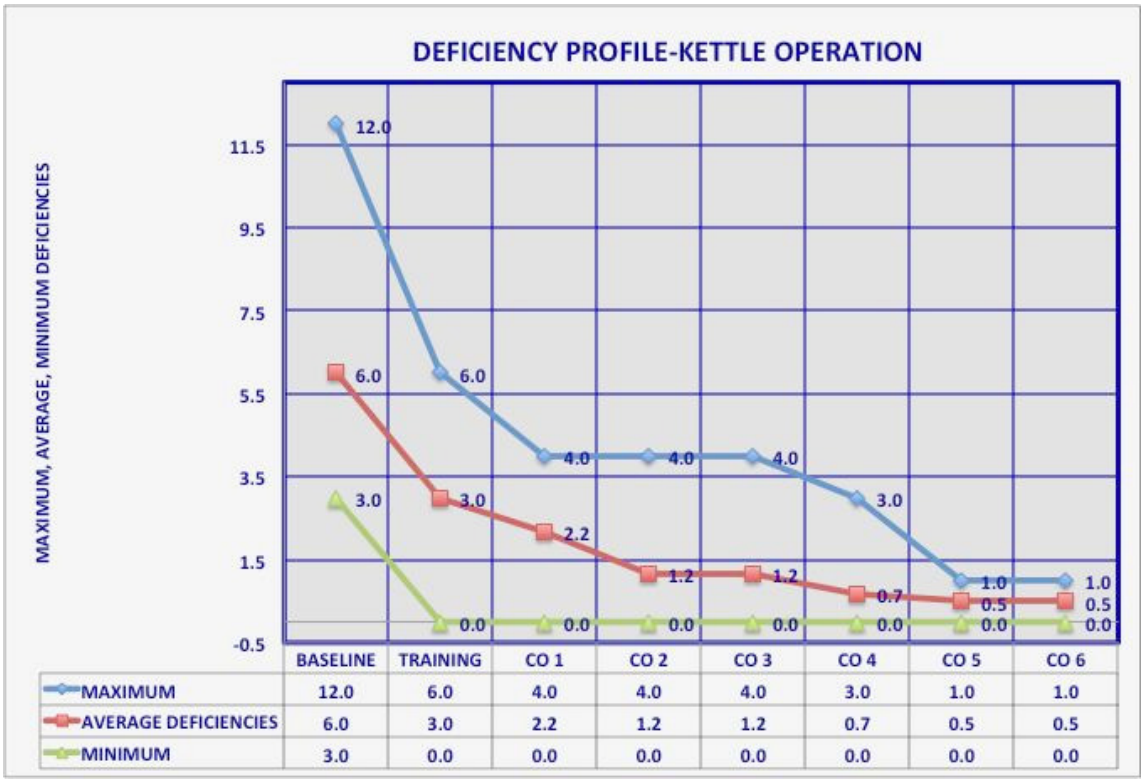
C. To make sure the entire operation was examined thoroughly and changed where necessary to ensure the most effective and safest hygiene practices were being trained and measured

D. To achieve positive, measurable long-term results in employee behavioral change

E. The operation chosen for study was the kettle operation (Fig. 1), with the specific step within that operation to be the "build the kettle" step (Fig. 2). The kettle operation process was broken into the following sets of behavioral steps in sequence:

1. Confirm the work order
2. Compare recipe with ingredients
3. Confirm quality
4. Confirm material
5. Confirm weights and quantities
6. Confirm cut size
7. Pre-cook operational check
8. Stage Ingredients
9. Follow recipe routing instructions
10. Pre-cook prepare certain ingredients
11. In-process hygiene
12. Cook, add ingredients in sequence, change heat in sequence
13. Monitor kettle building process

Figure 3. The average level of deficiencies at the baseline measurement and during 6 corrective observations.



Next, specific performance steps were determined for the sequence of behaviors and specification for the best behaviors were written within each sequence of behaviors. Then the team identified the critical behaviors to be measured and determined a list of the possible deficiencies for each critical behavior. Using this information, they then developed micro-pinpoint training courses to teach each critical behavior and developed plant processes for setting baseline and corrective observations. The management team and training consultant set a baseline for each behavior for each employee, trained the employees, observed and measured each worker, and gave individual feedback. They then implemented intervention and continued to train, measure, give feedback and implement interventions. They tracked results and reported on progress. The supervisors were trained to become Subject Matter Experts (SME) in kettle hygiene and to effectively coach their employees through the corrective observation process.

The process described above was executed efficiently and effectively. The supervisors were trained quickly to become effective SMEs and learn to effectively coach through the corrective observation process. It should be noted that the supervisors played a pivotal role in determining the most effective employee behaviors so they could become subject matter experts well before the employee training process was implemented. Many of the traditional employee training processes were replaced with new processes that were created by the consultant and supervisors (and approved by management), which created a great deal of motivation for the supervisors because they were given control to implement their own processes.

The training consultant worked with the plant quality control leaders until they learned to measure employee behavior in a consistent manner. The training system was set up rapidly, and the employees learned to access and use it effectively. It should be noted that given the organizational dynamics of the soup and sauce processing plant, it was not possible to have a control group (an untrained, minimally supervised group was not allowed by management).

Figure 4. Improvement of level of attainment of the Build the Kettle process from Baseline through training and corrective observation.

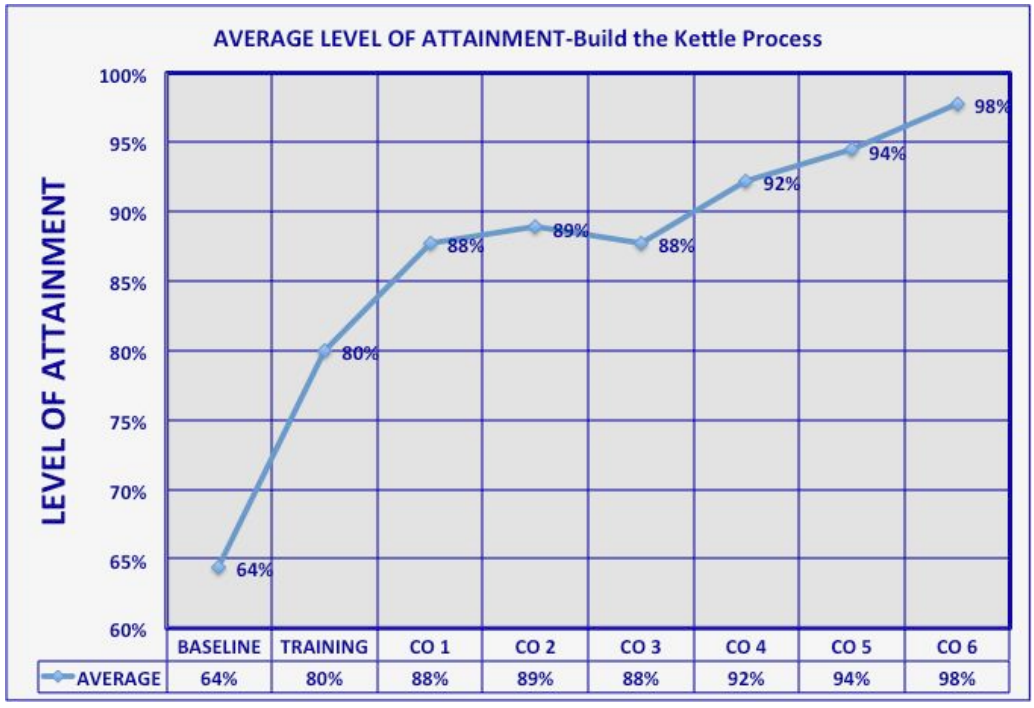
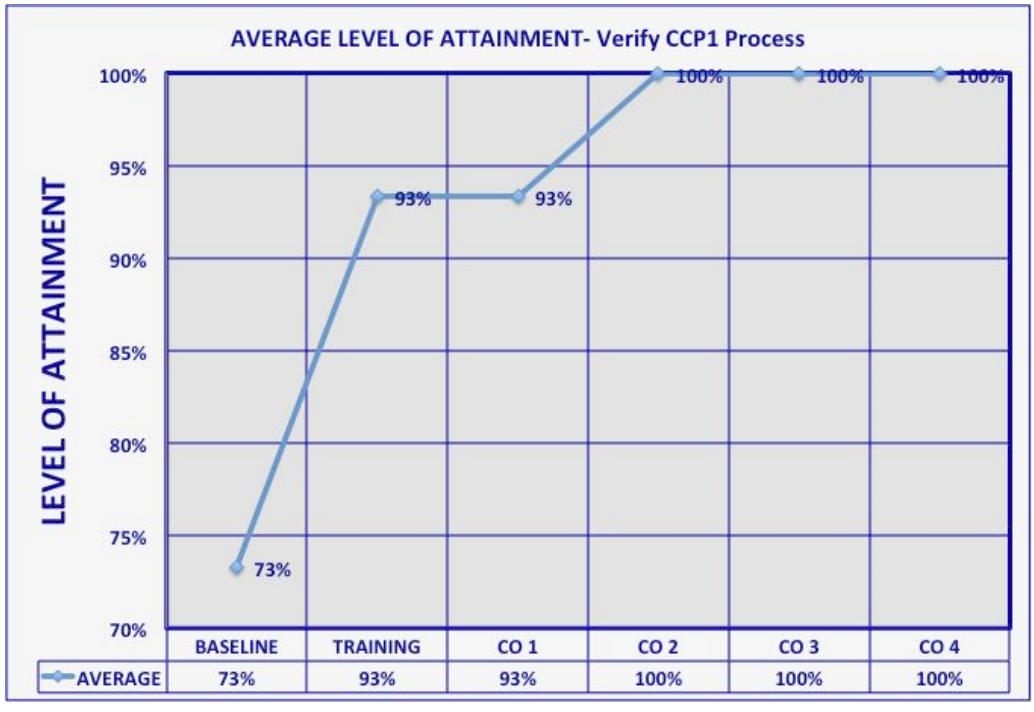


Figure 5. Improvement of verifying critical control point 1 (CCP1) from baseline through training and corrective observations.



RESULTS

For readers familiar with other case studies in food processing which focus on studying employee behavior change, the measurement process for the Building the Kettle process was different. The baseline measurements were employee performance deficiencies by category for each kettle build. Observations were made of the team on a whole kettle build and all of the deficiencies were noted. Due to the speed of work and the number of people working on a kettle build, it was not possible to assign deficiencies to individuals. This process did create a measure of the whole team building the kettle and caused very useful discussion regarding team improvement. It should also be noted that the team members working on the kettle build changed somewhat between measurements.

Figure 3 represents the average level of deficiencies observed for a group doing one kettle build operation. The chart also represents the maximum and minimum employee behavior for each category. The data represents the following specific processes which compose the kettle building process:

- Pre-Op Checklist
- Build the Kettle Process
- Verify CCP1 Process
- Spec Checking Process
- Kettle Cleaning Process
- Transfer Pump Cleaning Process

Due to the observations, the average level of deficiency from the baseline measurement diminished from the initial 6 deficiencies per kettle build down to an average of 0.5 deficiencies per kettle build. The maximum level of deficiency at the baseline before the study was 12, and the maximum diminished to 1 by the time of the 6th corrective observation. The deficiencies were measured over about an hour of time which was typically the amount of time to carry out the kettle building and cleaning process.

For the specific Build the Kettle process the base line level of attainment was 64% (Figure 4), and after training, the level of attainment jumped to 80%. The corrective observation process improved the level of attainment from 80% to 98%. The Verify Critical Control Point 1 (CCP1) process increased from the base line level of attainment of 73% to 93% after training to 100% after the corrective observation process went into effect (Figure 5).

The results of the Kettle Operation study were very encouraging. All baseline parameters showed significant improvement and brought the employee compliance in all behaviors into at least the 90% level of superior performance. Although the quality control staff believed the corrective observation process improved the employees' level of performance, plant management never totally bought into the study process and results, partly because the pen and paper record keeping of employee observations was very labor intensive.

DISCUSSION QUESTIONS

- How might a highly controlled study be set up in a manufacturing plant environment? Is it theoretically possible?
- Are there more automated ways Supervisors and QA personnel can document employee behavior observation and comply with the spirit of the Food Safety Modernization Act (http://www.fda.gov/Training/default.htm) ?
- Since any improvement process in a plant cannot be sustained without the continued support of plant management, what methods could be used to generate "buy in" from management?

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TEACHING NOTES

This case study discusses the implementation of training Hispanic employees in a food processing plant where English was not the primary language spoken by supervisors. It will give students the opportunity to discuss various realities of working in a food processing plant and various approaches to training employees to become better aware and prepared for critical thinking once they enter the work force. The workforce in the U.S. becomes more diverse each year. Students will need not only the ability to work in a diverse environment, as future managers, they will need to communicate, train and lead a diverse workforce.

TEACHING OBJECTIVES

This case study combines, processes, training and language barriers. The following discussion topics are provided as a guideline to facilitate discussions on this reality faced by managers.

- Training
  - Identification of job specific tasks that need to be taught
  - Training method
  - Use of non-verbal communication
- Food Safety
  - Prevention of Foodborne illnesses
  - Standard Operating Procedures
  - Good Manufacturing Practices
  - Hazard Analysis and Critical Control Points (HACCP)

TEACHING STRATEGY

This case study is based on a real world situation faced by many food producers. It is intended for undergraduate and graduate students pursuing degrees in food science as wells as a training tool for managers and trainers currently working in the food processing industry. The discussion topics are provided as a suggestion and to help stimulate and facilitate a candid and productive discussion. This case study may be used as part of an in class assignment which may include a lecture or as an in class exercise where students can role play the various roles such as the manager, trainer or non-English speaking employee. This may help facilitate empathy for non-English speakers, which has been demonstrated to reduce employee turnover. Additional research articles on this topic have been provided. For more information concerning the importance of management support or the consequences of not supporting an initiative, please see: http://www.analytictech.com/mb021/taylor.htm

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