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# Use of Visuals for Food Safety Education of Spanish-Speaking Foodservice Workers: A Case Study in Iowa

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**Abstract:** Providing food safety training to an audience whose native language is not English is always a challenge. In the study reported here, minimal-text visuals in Spanish were used to train Hispanic foodservice workers about proper handwashing technique and glove use based on the 2005 Food Code requirements. Overall, results indicated that visuals influenced participant knowledge about proper handwashing and proper glove use as evidenced by increased knowledge scores. Extension personnel can use visuals to train a wide variety of audiences about food safety, nutrition, occupational safety, and other topics.

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## Introduction

Food safety is a critical issue facing our food system. Every year, an estimated 9.4 million illnesses, 55,961 hospitalizations, and 1,351 deaths in the U.S. result from consumption of foods contaminated with known disease agents (Scallan et al., 2011b). An additional 38.4 million illnesses, 71,878 hospitalizations and 1,686 deaths are estimated to result from consumption of foods contaminated with unspecified agents (Scallan, Griffin, Angulo, Tauxe, & Hoekstra, 2011a). Many foodborne illnesses originate in foodservice establishments (Olsen, MacKinon, Goulding, Bean, & Slutsker, 2000). Improper cooking procedures, temperature abuse during storage, lack of hygiene and sanitation, cross-contamination between raw and fresh ready-to-eat foods, and acquiring food from unsafe sources are the five factors identified by the World Health Organization as common reasons for foodborne illness (World Health Organization, 2006). Since 59% percent of the reported outbreaks of food borne illness occur in retail foodservices (Vugia et al., 2008), it is important that

food safety training and education be provided to food handlers employed in foodservice establishments.

Extension personnel are often providers of food safety training, notably food safety certification programs. Most food safety training and education programs are taught in a lecture format and have a primary objective of providing information to achieve certification. It is desirable that training and education be conducted such that it involves different training methods that tend to the needs of a diverse audience. According to the National Restaurant Association (2009), one of every four restaurant employees in 2006 was foreign born, with Mexico the dominant country of origin (40%), and an additional 10% from Central America; thus, 50% of foreign-born workers in the foodservice industry are from Spanish-speaking countries.

Rudder (2006) showed that language barriers and lack of knowledge and understanding of the principles of food safety were major barriers in promoting food safety. The use of different types of training methods and styles of communication such as story telling are considered to be especially important when training an audience whose native language is not English (Bermúdez-Millán, 2004). One of the methods for presenting information is "visuals" (videos, charts, or pictures). By being able to see the food safety concepts, the audience will be able to understand the food safety message better than they would with just lecture. The use of visuals in food safety training can create a non-threatening, informal atmosphere that can enhance learning as compared to a formal, stand-up presentation, which may be uncomfortable for some learners. Creative ways of training minority audiences can help Extension personnel reach a wide spectrum of individuals with varying levels of literacy and understanding of the English language.

One particular population that could benefit from this type of training is the immigrant Hispanic population. The Hispanic population is rapidly increasing in the United States and comprises over 15% of the population (U.S. Census Bureau, 2011). This change in composition of clients may present Extension educators with concerns about effective strategies to communicate information. Hispanic immigrants are employed in various with a significant number working in foodservice establishments and meat packing plants, because these jobs do not require prior work experience (U.S. Bureau of Labor Statistics, 2011).

A study by Stanifer (2008) found that health-code violations in ethnic owned restaurants averaged 2.2 critical violations and 4.7 non-critical violations, as opposed to 0.8 critical violations and non-critical 2.8 critical violations in non-ethnic owned restaurants in the United States. Because most workers in ethnic restaurants tend to be ethnic minorities, it seems logical that providing training in a person's native language with simple tools and visual aids will assist in getting the message across and encouraging behavior change.

## **Purpose and Objectives**

The purpose of the study reported here was to develop visuals to train non-English speaking Hispanic foodservice workers about safe food handling practices. The study emphasized proper handwashing technique and gloves use as prescribed by the 2005 Food Code (U.S. Food and Drug Administration, 2005), because improper handwashing and improper glove use have been implicated frequently in

incidences of foodborne illnesses (Guzewich & Ross, 1999; Green et al. 2007). The specific objectives of the study were:

- 1) Develop a food safety training module that utilized visuals as the key training method.
- 2) Develop minimal text in Spanish to use in concert with the visuals.
- 3) Assess impact of the training on food safety knowledge of non-English speaking Hispanic foodservice workers.

## Methods

The study was carried out in collaboration with the Iowa State University Extension in Wapello County, Iowa. The Hispanic population is the largest minority population in the state of Iowa (4.5% of the total state population), and Wapello County experienced a 225.9% increase in its Hispanic population between 2000 and 2009 (Iowa Data Center, 2010). The Nutrition and Health Extension specialist for the area had been providing food safety training, yet realized the need to reach increasing numbers of ethnic restaurants featuring Mexican cuisine.

The training sessions were carried out at the Wapello County Extension office and at restaurants in and near Wapello County with known high numbers of limited English Spanish-speaking workers to encourage participation because most participants preferred on-site training or training at locations of familiarity. Training was conducted with assistance from a Spanish translator who was employed as an Extension field specialist. Restaurant managers were contacted via phone by the Extension field specialist. The purpose of the phone call was explained, and participation in this training was requested.

Prior to beginning the study, the PI attended the pre-existing food safety training for non-English speaking Hispanic foodservice workers for a pre-assessment. The pre-existing training offered was found to contain large amounts of text in English, which was not the native language of the participants. Discussions with the Wapello County food safety inspector were also held prior to training, with common food safety violations in ethnic restaurants identified. The most common violations identified were: inadequate handwashing, time-temperature abuse of food, bare-hand contact of ready-to-eat foods, improper sanitizing procedures, and not using thermometers to check end-point temperatures.

The assessment aided in identifying areas needing improvement and in development of training materials. It was concluded that training materials should consist of pictures depicting food safety procedures and contain minimum amount of text. The project focused on proper handwashing technique and proper glove use when handling food according to 2005 Food Code requirements. Minimal-text visuals containing food safety messages to educate non-English speaking Hispanic foodservice workers about proper handwashing technique and proper glove use were developed and translated into Spanish (Figure 1).

**Figure 1.**  
Visuals Containing Minimal-text Handwashing and Glove Use Visuals in Spanish

## A lavarse las manos! Como hacerlo!



1. Mójese las manos con agua tibia.



2. Use el jabón.



3. Restriéguese las manos de 10-15 segundos.



4. Limpiese las uñas y entre los dedos.



5. Enjuáguese las manos con suficiente agua.



6. Séquese las manos con toallas de papel o con una secadora de manos.

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TOCAR ALIMENTOS LISTOS PARA EL CONSUMO SIN EL USO DE GANTES ES PROHIBIDO – CDC Food Code 2005



Cuando los guantes se rasgan o rompen



Antes de preparar otro tipo de alimentos



Después de tocar cualquier cosa que pudiera contaminar sus manos.

## Cuando cambiar de guantes?



Cuando prepara alimentos listos para el consumo como limones o tomates.



Al menos cada cuatro horas cuando se trabaja en la misma tarea.



Después de toser o estornudar

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YUCK photos developed in Spanish by the Iowa State University Food Safety project available at <<http://www.iowafoodsafety.org>> were also used as part of the training. YUCK photos include a series of pictures depicting microbial growth on unclean and clean surfaces and hands, and unhygienic food handling. These pictures can be used as training aids for audiences from retail and non-retail settings. A five-question assessment containing visuals was developed in Spanish and administered before and after training to determine knowledge of concepts (Figure 2). This assessment was purposely kept short to ensure completion. Questions related to key concepts discussed in the training were included.

### Figure 2.

Questionnaire with Visuals Used Before and After Training

#### Que piensas?

Por favor mira las siguientes fotografías y completa las preguntas.  
Marca con una X la respuesta que consideras es la correcta.

1) Es necesario usar guantes al limpiar una mesa?



\_\_\_ Si \_\_\_ No

2) Consideras que secarse las manos usando un delantal limpio y seco es una forma correcta?



\_\_\_ Si \_\_\_ No

3) Crees que la temperatura del agua cuando te lavas las manos debe estar fría (50°F), de manera que puedas lavártelas por mucho más tiempo?



\_\_\_ Si \_\_\_ No

4) Es necesario lavarse las manos y ponerse guantes antes de tocar los alimentos después de haber tocado la puerta del refrigerador?



\_\_\_ Si \_\_\_ No

5) Es ésta una forma segura de manipular los alimentos?



\_\_\_ Si \_\_\_ No

Using visuals in the questionnaire was a novel way to enable those participants who did not have high reading skills (in English or Spanish) to comprehend the question being asked. The questionnaire was validated by faculty in the program of Hospitality Management at Iowa State

University.

Five separate 1-hour training sessions were conducted. The training consisted of the following components:

- a. Completion of pre-training questionnaire.
- b. Viewing the Handwashing for Life<sup>®</sup> video (a graphic, non-scripted depiction of why handwashing can curtail spread of harmful pathogens; more information available at [www.handwashingforlife.com](http://www.handwashingforlife.com)).
- c. Overview of foodborne illness and unsafe food handling behaviors using PowerPoint<sup>™</sup> slides with minimal-text visuals.
- d. Introduction to correct handwashing technique.
- e. Handwashing exercise using GlitterBug<sup>™</sup> lotion.
- f. Introduction to proper glove use by viewing the "Why? When? What?" of glove use Flash<sup>™</sup> animation with Spanish text available at <http://www.iowafoodsafety.org>.
- g. Review of training and completion of post-training questionnaire.

After training, all participants received handouts developed in the project depicting proper handwashing technique and proper glove use (Figures 1). In addition, participants also received the Spanish version of the four-page publication *Guide to Food Safety (La Guía sobre Inocuidad de los Alimentos)* developed by Iowa State University Food Safety project (Iowa State University Extension, 2008), which contained fundamental messages about handwashing and health, temperature controls, and cleaning and sanitizing (available in English and Spanish at <http://www.iowahaccp.iastate.edu>).

## Results

A total of 31 Hispanic foodservice workers from 10 different Mexican food-serving restaurants participated in the study. The sample consisted of 21 males and 10 females. A majority of the participants were between 21-50 years (80.6%). The number of years worked in foodservice ranged from less than 1 year (29.0%) to more than 12 years (6.5%). Major duties of the participants were either front of the house (45.2%) (serving food, managing the cash register, taking food orders) or back of the house (32.2%) (preparing food, dish room duties), and some workers worked in both areas (22.6%). Demographic information is summarized in Table 1.

**Table 1.**  
Demographic Characteristics of Participants (n = 31)

| Demographic Characteristics | n (%) |
|-----------------------------|-------|
|-----------------------------|-------|

| <b>Age</b>                                   |           |
|--|-----------|
| Less than 21 years                           | 4 (13.0)  |
| 21-30 years                                  | 10 (32.3) |
| 31-40 years                                  | 9 (29.0)  |
| 41-50 years                                  | 6 (19.3)  |
| 51-60 years                                  | 1 (3.2)   |
| More than 60 years                           | 1 (3.2)   |
| <b>Gender</b>                                |           |
| Male   | 21 (67.7) |
| Female                                       | 10 (32.3) |
| <b>Number of Years Worked in Foodservice</b> |           |
| Less than 1 year                             | 9 (29.0)  |
| 1-3 years                                    | 12 (38.7) |
| 4-6 years                                    | 6 (19.4)  |
| 7- 10 years                                  | 1 (3.2)   |
| 10-12 years                                  | 1 (3.2)   |
| More than 12 years                           | 2 (6.5)   |
| <b>Major Duties in the Workplace</b>         |           |
| Front of the house                           | 14 (45.2) |
| Back of the house                            | 10 (32.2) |
| Both (FOH + BOH)                             | 7 (22.6)  |

Prior to training, participant knowledge varied regarding situations when hands should be washed and gloves should be worn. After training, participant responses to all questions improved, in particular; knowledge about water temperature for handwashing (100%), handling ready-to-eat foods (96.8%), washing hands after touching refrigerator door (96.8%), and wiping hands on apron (93.4%). However, participants responded similarly to the question "Es necesario usar guantes al limpiar una mesa?" (Is it necessary to wear gloves when cleaning a table?) before (67.8%) and after training (64.6%). Participants were unsure if the question implied that the individual would also be handling food after cleaning the table or not, suggesting that the question should be rewritten to make it understandable and clear. Table 2 summarizes responses to the questionnaire before and after training. Responses in bold correspond with the 2005 Food Code regulations and are the correct responses.

**Table 2.**  
Participant Responses to Questionnaire Before and After Training. (n = 31)

| <b>Questions</b>  | <b>Before Training<br/>n (%)</b>                | <b>After Training<br/>n (%)</b>               |
|---|---|---|
| Es necesario usar guantes al limpiar una mesa?<br>(Is it necessary to wear gloves when cleaning a table?)   | <b>Yes = 21 (67.8)</b><br>No = 10 (32.2)        | <b>Yes = 20 (64.6)</b><br>No = 11 (35.4)      |
| Consideras que secarse las manos usando un delantal limpio y seco es una forma correcta?<br>(Is wiping your hands on a clean, dry apron a safe way to dry your hands?)  | <b>Yes = 9 (29.0)</b><br><b>No = 22 (71.0)</b>  | <b>Yes = 2 (6.4)</b><br><b>No = 29 (93.4)</b> |
| Crees que la temperatura del agua cuando te lavas las manos debe estar fría (50°F), de manera que puedas lavártelas por mucho más tiempo?<br>(Should the water temperature when you wash your hands be cold (50°F) so you can wash hands for a long time? ) | <b>Yes = 15 (48.3)</b><br><b>No = 16 (51.7)</b> | <b>Yes = 0 (0.0)</b><br><b>No = 31(100.0)</b> |
| Es necesario lavarse las manos y ponerse guantes antes de tocar los alimentos después de haber tocado la puerta del refrigerador?<br>(Is it necessary to wash hands and wear gloves when handling food after touching the refrigerator door?)               | <b>Yes = 26 (84.0)</b><br>No = 5 (16.0)         | <b>Yes = 30 (96.8)</b><br>No = 1 (3.2)        |
| Es ésta una forma segura de manipular los alimentos?<br>(Is this a safe food handling practice?)  | <b>Yes = 7 (22.6)</b><br><b>No = 24 (77.4)</b>  | <b>Yes = 1 (3.2)</b><br><b>No = 30 (96.8)</b> |

## Discussion, Implications, Conclusions

The study reported here showed that using visuals for training was helpful to train participants about proper handwashing and glove use, as evidenced by improvement in knowledge scores after training. Individuals who cannot read Spanish can view the visuals, understand the topic being discussed, and learn about proper handwashing technique and proper glove use when handling food. Conducting training in the participants' native language helped address language as a barrier in food safety and provided a non-threatening environment for learning. It was found that participants were willing to participate and learn when they were provided with support in the form of training, a finding similar to that of Rudder (2006) with ethnic minority retail businesses.

Roberts et al. (2008) showed that food safety training can significantly influence food safety

knowledge and behaviors of foodservice employees, although increased food safety knowledge may not always transfer into behavior change. However, an understanding of the correct way to wash hands or wear gloves is needed before proper behavior can be practiced. Behavior change can also occur if foodservice workers are provided with the rationale for performing food safety practices, such as, proper handwashing and proper glove use. In addition, training should be provided periodically so that foodservice workers stay abreast of changing food safety regulations. Iowa adopted Food Code 2005 in July 2008; prior to that adoption, bare hand contact with ready-to-eat foods had been allowed providing proper handwashing had occurred. Thus, this training provided updated information for some of the participants. Providing training along with hands-on activities will enable learners to better learn the concepts being discussed.

Reaching the Hispanic population and educating them can involve several challenges. According to Farner, Rhoads, Cutz, and Farner (2005), language barrier, lower education level, and a rigorous work schedule can make it challenging to educate the Hispanic population. However, in the study reported here it was found that participants were willing to participate in training if they were able to see the benefit to training. Participants were more willing to participate in training if they were encouraged to participate by those they trust, a finding similar to that observed by Escobar-Chaves, Tortolero, Masse, Watson, and Fulton (2002) and Fidalgo and Chapman-Novakofski (2001). In the study, the Spanish interpreter served as the individual the participants trusted because he was a well-known individual in the Iowa Hispanic community and had worked with the participants on numerous occasions in the past. Thus, they felt comfortable attending the training sessions when he invited them. The owners of restaurants also served as persons of trust who encouraged employees to participate in the training. Once the participants attended the training session and saw its benefits, they encouraged others to attend.

Initial training sessions were made up of three-four participants; however the number of participants increased to six-eight participants during the latter part of the study, because the availability and usefulness of training spread by word of mouth. Extension educators must consider cultural differences of their audiences when seeking participation and maintain cultural sensitivity to gain trust and continued participation. One informal positive outcome of the project was to increase acceptance by participants of Extension educators in the community.

Challenges were experienced with recruiting participants for the study owing to the voluntary nature of participation and possible anxiety among participants because of their immigrant status. Participants expressed concern that because the trainings were held in the mornings, it was difficult for them to attend training due to lunch hour duties. Hence, it was decided that all training sessions would be conducted on-site for the next phase of the study because it might result in increased participation. The sample in the study reported here was small ( $n = 31$ ); future studies should be carried out with a larger sample. Providing some form of monetary incentive or other "token of appreciation" would encourage individuals to attend the training sessions. Strategies such as "knowing your audience and developing an understanding of the Latino culture, strengthen relationships with organizations already serving Latino families, and building relationships within the Latino community" have also been suggested for recruiting Latinos to education programs (Allen, Gudino, & Crawford, 2011).

Although the study was conducted with a small number of participants in only one geographic

setting, it provides evidence for the success of using limited text visuals in educating Hispanic foodservice workers about safe food handling behaviors. Extension educators can employ visuals to educate audiences of different ethnicities, stay at home mothers, children, and individuals with learning disabilities. Visuals can also be used to educate participants about nutrition, occupational safety, safety at home, and other similar topics.

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