An Exploratory Study of Finished Product Testing in Georgia

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Abstract

This exploratory study examined finished product testing as a verification method for the Food Safety Modernization Act Preventive Controls for Human Food and the Georgia Food Act Chapter 40-7-18 finished product testing requirement. While this study did not validate product testing, the research provided information on how the Georgia manufactured food industry is verifying food safety controls. The methodology utilized an electronic survey with nine multiple choice questions and a voluntary comment box. The study received responses from 46 of 230 contacted firms. The results of the study indicate that 45 percent of Georgia facilities in the sample are verifying their food safety plans with product testing; product testing is used with a variety of 21 types of products; *Salmonella* is the highest target pathogen followed by *Listeria spp., Listeria monocytogenes,* and *Escherichia coli*; and 28 percent of firms who list “product testing” as their verification activity are able to use their current product testing procedures to satisfy both state and federal requirements. The study recommends Georgia facilities modify testing programs to meet both state and federal regulations; the Georgia Department of Agriculture should share the findings of this study to highlight compliance using available resources; the Food Safety Preventive Control Alliance should provide a guidance document for verification procedures to support FSMA compliance.

Keywords: finished product testing, FSMA, verification, Georgia Food Act, pathogens, 40-7-18, *Salmonella, Listeria, Escherichia coli*

Background

Recalls are initiated for violative products that have entered into commerce when there is reason to believe that food product may cause consumer to become ill. In many cases, a sample of product will be collected while in distribution channels and tested for adulteration. Products found to be violative may then be recalled by the distributor or manufacturer. There were 242 recalls of Food and Drug Administration (FDA) regulated human foods in 2017, 44 of which were initiated because product testing revealed the presence of *Listeria monocytogenes (Lm), Salmonella, E. coli*, or Hepatitis A (FDA, 2018).

In Georgia, food processors must report positive test results to the Georgia Department of Agriculture (GDA) within 24 hours of receiving the result, even if the product did not leave the control of the manufacturer (Georgia Food Act, 2018). In 2018, Georgia food processors reported 9 positive results for the presence of *Listeria spp, Lm, or Salmonella* (Manson & Sauceda ,2019).

Georgia Senate Bill 80 was passed in 2009 and the Georgia Food Act Chapter 40-7-18 (2018) was promulgated in response to outbreaks associated with peanut paste and peanut butter. Chapter 40-7-18 (2018) requires facilities to conduct finished product and finished ingredient testing. Processing plants that fail to comply are subject to civil penalties including monetary fines, and/or charged with a criminal misdemeanor or felony.

While the GDA requires product testing (GDA 40-7-18 .05-.08) and the FDA Food Safety Modernization Act (FSMA) (2011) Preventive Controls for Human Food (PCHF) (2015) allows for product testing as verification (21 CFR 117.165), the agencies have different standards.

Both agencies address scientific validity, tests methods, laboratories, samples, frequencies, and corrective actions. However, the GDA frequency is established by the Commissioner, whereas the FDA lacks a frequency guideline. The corrective action procedures and identification of specific lots of product must be written for FDA, but not for GDA. Table 1 shows the basic requirements from each regulatory agency.

Table 1

Comparison of PCHF and GDA Testing Requirements

PCHF Requirements of Product Testing	GDA Product Testing Requirements
Be scientifically valid Identify the test microscopic organisms	Must be sufficient to detect the microscopic organism
Specify the procedures for identifying samples and the relationship to lots	Samples must be representative and according to the scale of the operation
Must include number of samples and frequency	Testing conducted at frequency established by the department
Identify test method used Identify laboratory conducting the testing	Testing must be performed according to standards outlined by an internationally recognized certification body
Include corrective action procedures	Presumptive positives shall be carried out

Note: The table illustrates the substantial differences between the testing requirements for the two agencies.

Product testing can identify pathogens in a suspect food during a foodborne illness investigation and testing can pinpoint processing areas of contamination in processing plants. As a result of testing, the food industry can remove potentially contaminated food from the marketplace or prevent it from entering commerce in the first place. However, product testing cannot be used for verification if the method is not validated. While this

study did not validate product testing, the research provided information on how the Georgia manufactured food industry is verifying food safety controls.

Problem Statement

No study has been conducted on how Georgia manufacturers are conducting finished product testing and whether this testing could be used as a verification effort to comply with the Food Safety Preventive Control for Human Food rule.

Research Questions

1. How are Georgia processors testing their finished products?
2. Can Georgia processors use their current product testing procedures for state regulations and FSMA verification?

Methodology

An electronic survey was developed and administrated using SurveyMonkey to Georgia manufacturing facilities producing a ready to eat product or ingredient. Surveys were sent to 230 firms, resulting in 46 responses. A cover letter containing the survey link was electronically mailed to each firm. The survey included 9 multiple choice questions regarding products produced, microscopic organisms, frequencies, verification methods, corrective actions, lot codes, test methods as well as a voluntary comment box. Responses were anonymous. No pilot test was conducted. Since an adequate response was received, no follow-up contact was attempted.

Results

Results from the survey indicated a variety of products are produced in Georgia as shown in Table 2 Product Types.

Table 2

Product Types Receiving Finished Product Testing by Georgia Manufacturers

Product Type	Respondents (n)
Alcoholic Beverage	2
Bakery Product, Dough, Mix, Icing	12
Beverage Base, Concentrate, Nectar	3
Candy without Chocolate, Specialty, Chewing Gum	2
Cereal Prep, Breakfast Food	4
Cheese, Cheese Product	1
Coffee, Tea	3
Dressing, Condiments	6
Food Service, Conveyance	2
Food Sweetener, Nutritive	2
Fruit, Fruit Product	4
Gelatin, Rennet, Pudding Mix, Pie Filling	1
Macaroni, Noodle Product	1
Nuts, Edible Seed	6
Prep Salad Products	0
Snack Food Item	5
Soft Drink, Water	1
Spices, Flavors, Salts	4
Vegetable Oils	1
Vegetable Product	6
Whole Grain, Milled Grain Product, Starch	3

Note: The table illustrates the wide variety of products being tested.

Processors reported testing for different microorganisms. *Salmonella* was the highest target pathogen (91 percent). *Listeria spp.* and *Lm* were 60 percent and 34 percent, respectively. Sixty percent of processors responded testing for *E. coli*, regardless of the product types. *Staphylococcus aureus* was tested for in all types

except alcoholic beverages; soft drinks, water; and grain, starch. Specific products were also tested for unique microscopic organisms or chemicals. Table 3 illustrates target organisms or chemical.

Table 3

Targets tested using finished product testing by Georgia manufacturers

Target	Respondents (n)
Aerobic plate count	5
Bacillus cereus	1
Clostridium botulinum	1
Coliform	5
E. coli	28
Enterovirus	1
Listeria spp.	28
Listeria Mono	16
Mycotoxins	2
Pseudomonas	1
Salmonella	42
Staphylococcus aureus	8
Yeast and Mold	7

Note: The table illustrates that testing is concentrated on three organisms.

Testing was most often conducted at a monthly frequency (43 percent) and 23 percent of processors reported testing every lot. The remaining frequencies were daily, weekly, bi-weekly, semi-monthly, and quarterly; with quarterly being least reported frequency.

When asked about lot codes and product descriptions, 63 percent answered that both are listed on the report of the analysis; 20 percent include only the product description and 10 percent include only the lot code. The remaining firms use a general product identifier.

Nearly all survey respondents indicate listing the laboratory test method for product testing, (91 percent) and 90 percent report having a written corrective action procedure on file.

Based on the survey, the verification method firms are relying on most heavily is product testing, at 45 percent. Environmental monitoring ranked second (23 percent) followed by calibration of monitoring equipment and accuracy checks. Finally, record review is the least reported verification method at 13 percent.

Conclusions

Given the response rate of 20 percent, a couple of conclusions can be made. 1) In this study, in the sample, Georgia facilities are verifying food safety plans with product testing. 2) Only 28 percent of firms who list product testing as their verification activity are able to use their current product testing procedures to meet both GDA Chapter 40-7-18 and FSMA regulations.

Recommendations

1. Georgia finished product manufacturing facilities should modify testing programs to satisfy both state and federal regulations.
2. The GDA should share report findings with Georgia manufactures to illustrate their compliance using available resources such as the agency's website, industry newsletter, face to face or virtual meetings (e.g. Georgia Food Safety Task Force or related events) or other communication avenues as deemed appropriate and effective.

3. The Food Safety Preventive Controls Alliance (FSPCA) should provide written guidance for verification procedures so industry can uniformly comply with federal requirements.

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