

The Occurrence of Foodborne Illness Risk Factor Violations in the State of Montana



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ABSTRACT

The purpose of this research was to determine the most common foodborne illness risk factor violations observed during retail food inspections performed throughout Montana. Counties who had completed inspections in October 2018 were requested to provide the inspection forms to the Food and Consumer Safety Section (FCSS) of the Department of Public Health and Human Services (DPHHS). Completed forms from participating counties were collected and the data extracted and compiled. Evaluation of the data was used to find commonalities and to identify areas in need of improvement. Standardization status and the presence of a Certified Food Protection Manager (CFPM) on site were also examined to determine possible effects on the quantity and quality of observed risk factor violations. The data revealed improvements needed in areas relating to Improper Holding/Time and Temperature, Contamination, and Poor Personal Hygiene. Standardized counties reported a higher percentage of items marked out-of-compliance (OUT) and repeat violations (R). Non-standardized counties reported a higher percentage of corrected on site observations (COS) and data items not observed (NO). Establishments marked out-of-compliance for CFPM, showed a higher percentage of risk factor related violations, than establishments with CFPM marked as in compliance (IN). The results of this study recommend continuation of standardization and CFPM requirements. It is important to note that due to the methodology and limitations of this study, it is not equivalent to a Risk Factor Study that achieves the criteria of Standard 9. It is recommended that a Standard 9 Risk Factor Study be conducted to provide additional data for further analysis.



INTRODUCTION

The Center for Disease Control (CDC) estimates that foodborne diseases cause illness in approximately 48 million Americans, 128,000 hospitalizations, and 3,000 deaths each year¹. There are five major risk factors that have shown to contribute to foodborne illness.

Five Major Risk Factors Contributing to Foodborne Illnesses

- Improper Holding/Time and Temperature
- Inadequate Cooking
- Contaminated Equipment/Protection from Contamination
- Food Obtained from Unsafe Sources
- Poor Personal Hygiene

In the 2013-2014 FDA Risk Factor Study, it was determined that national improvement was needed in areas relating to Improper Holding/Time and Temp, Contaminated Equipment/Protection from Contamination, and Poor Personal Hygiene². The purpose of this study was to identify the most common risk factor violations observed throughout Montana. The data collected were also used to analyze the effects that standardization and/or the presence of a CFPM may have on the quantity and quality of reported violations.

Definitions

- Observation** – Any data item marked with a compliance status.
- Violation** – Any data item marked as out-of-compliance.
- Standardization** – Process that provides retail food inspection personnel with training that helps to reduce and prevent foodborne illness. The process utilizes procedures based on the FDA Food Code to create a uniform “system of measurement” which ensure retail food establishments remain safe and are honestly represented³.
- CFPM** – Certified Food Protection Manager. A person who has completed a course and passed an exam provided by an accredited food management program. Establishments deemed to pose a low risk of causing or contributing to foodborne illnesses may be exempt from requiring a CFPM. An example of such an establishment is a Coffee Shop that does not serve Time Control for Safety (TCS) foods or exceed the reheating/cold holding/hot holding requirements for processed and packaged ready-to-eat (RTE) foods^{4,5}. These establishments are marked as Not Applicable (NA) for CFPM presence.

METHODS

A total of 786 Retail Food Establishment Inspection Reports were requested from 42 counties that conducted inspections during October of 2018. Qualifying reports included routine inspections of establishments that were operational at the time of inspection and had at least 75% of data items marked with a compliance status.

Data Item Compliance Statuses

- IN - Found in Compliance
 - OUT - Found out-of-compliance
 - NA - Not Applicable
 - NO - Not Observed
- For Data Items Marked Out-of-compliance:
COS – Corrected on Site R – Repeat Violation

Several data items were associated with a major foodborne illness risk factor to determine the count and percentage of reported violations.

Foodborne Illness Risk Factor	Associated Data Items ^{2,5}
Poor Personal Hygiene	#8 - Hands clean & properly washed #9 - No bare hand contact with RTE food or a pre-approved alternative procedure properly allowed
Food Obtained from Unsafe Source	#11 - Food obtained from approved source #12 - Food received at proper temperature #13 - Food in good condition, safe, & unadulterated
Contaminated Equipment/Protection from Contamination	#15 - Food separated & protected #16 - Food-contact surfaces: cleaned & sanitized
Inadequate Cooking	#18 - Proper cooking time & temperatures #19 - Proper reheating procedures for hot holding #20 - Proper cooling time & temperatures
Improper Holding/Time Temperature	#21 - Proper hot holding temperatures #22 - Proper cold holding temperatures #23 - Proper date marking & disposition

Observations for each associated data item were counted, and the results were compared to the total number of observations for the corresponding risk factor. This determined the percentage of violations per foodborne illness risk factor. The following formula was used to find each percentage:

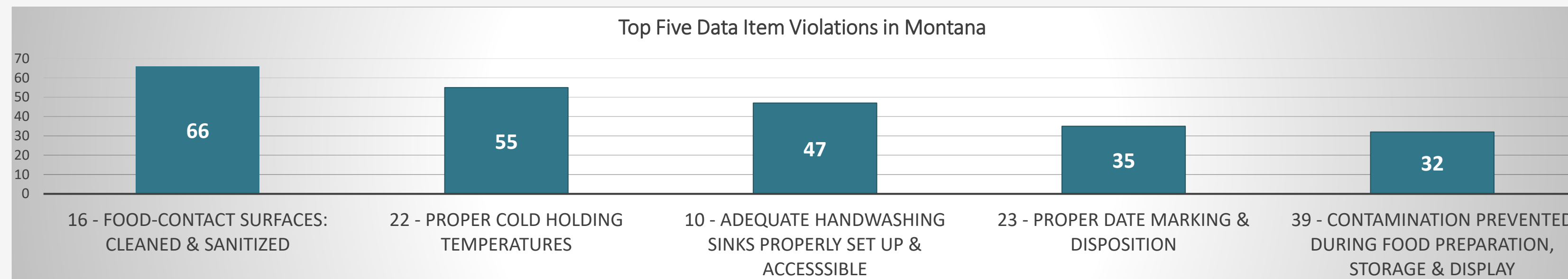
$$\% \text{ of Violations Marked} = \frac{\text{Total number of OUT data items for the risk factor}}{\text{Total \# of observations for the risk factor}} * 100$$

RESULTS

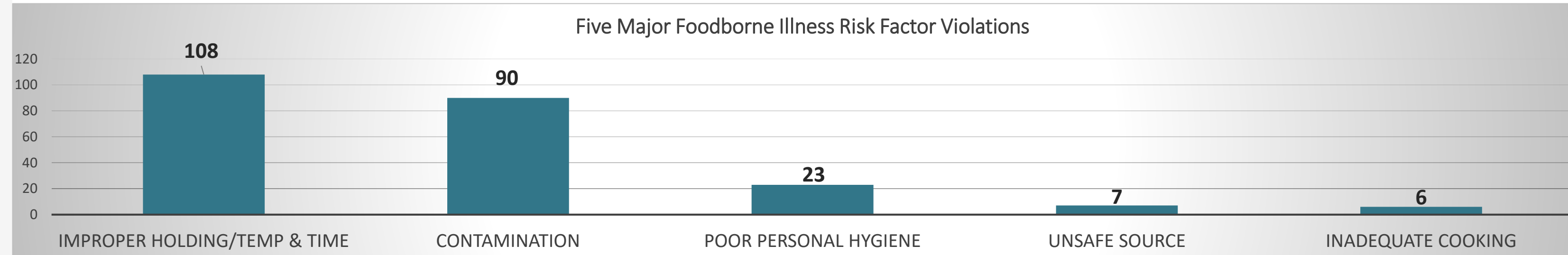
Nineteen counties submitted 468 reports. Of those submitted, 398 reports qualified for this study. Each report contained 56 data items for a total of 22,280 possible data item observations. There were 28 missing marks resulting in 22,260 total observations that were compiled and sorted by compliance status. The following table displays the results of the compilation for all participating counties:

Data Item Compilation for All Counties													
Group	IN	%IN	OUT	%OUT	N/A	% N/A	N/O	% N/O	COS	%COS	R	%R	Total Obs.
All Counties	17111	76.86	664	2.98	3246	14.58	1239	5.56	148	22.28	98	14.75	22260

Table 1. Total observations from all qualifying retail food establishment inspection reports.



Graph 2. Top five violations observed during the month of October in 2018.



Graph 1. The total count of violations related to each major risk factor out of 22,260 observations. Improper Holding/Temp & Time had the most violations with 108 data items marked out-of-compliance. Contamination had the second highest amount of violations with 90 out-of-compliance observations. Poor Personal Hygiene came in third with 23 out-of-compliance observations. Unsafe Source and Inadequate cooking had the least number of violations with 7 and 6 data items, respectively.

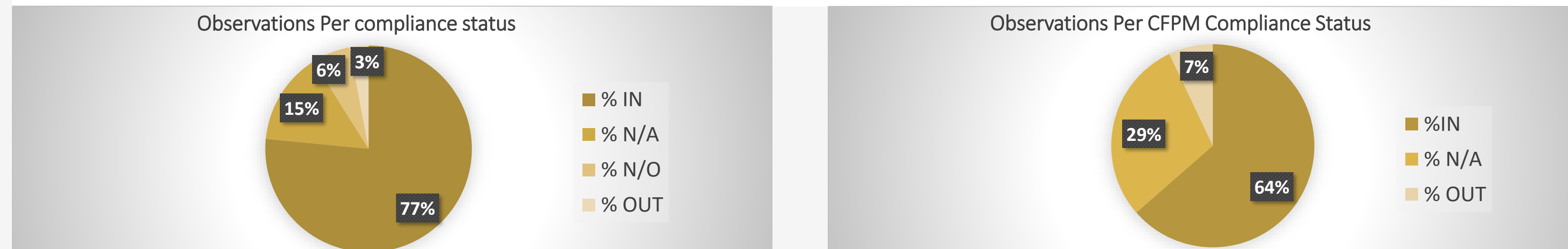
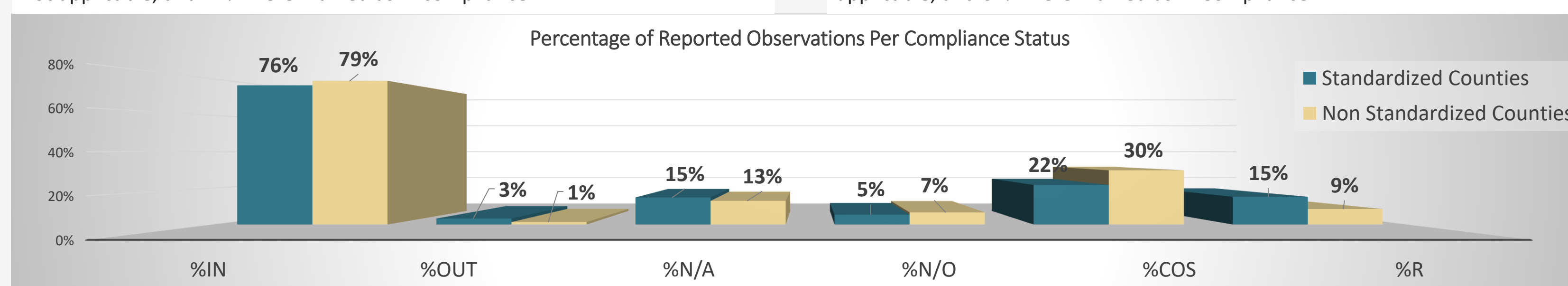


Figure 1. Of the total reported data item observations compiled, 3% were marked out-of-compliance, 6% were marked not observed, 15% were marked not applicable, and 77% were marked as in compliance.

Figure 2. Of the total reported data item observations compiled, 7% were marked out-of-compliance for CFPM presence, 29% were marked not applicable, and 64% were marked as in Compliance.



Graph 3. Standardized counties reported more out-of-compliance data items (OUT) and repeat violations (R) than non standardized counties. Non standardized counties reported more corrected on site (COS) and not observed (NO) data items.

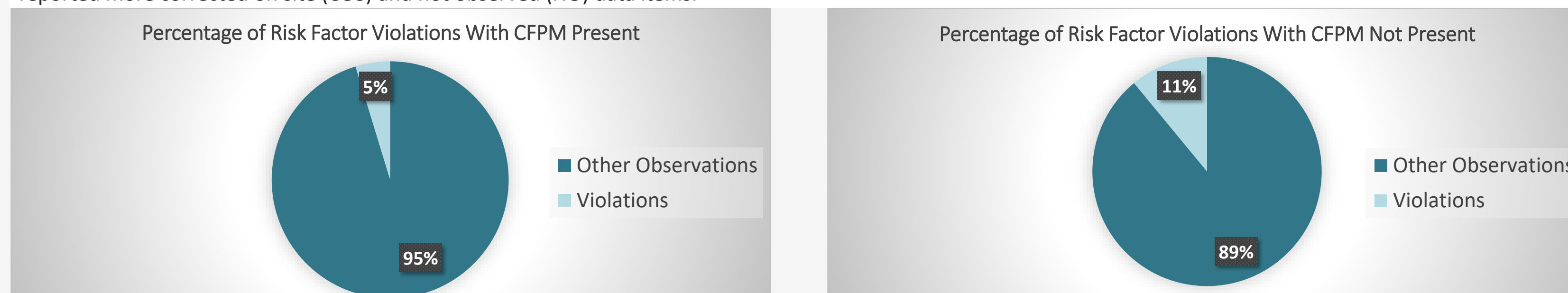


Figure 3. When CFPM was marked as In Compliance, 5% of risk factor related observations were found out-of-compliance.

Figure 4. When CFPM was marked as Out-of-compliance, 11% of risk factor related observations were found out-of-compliance.

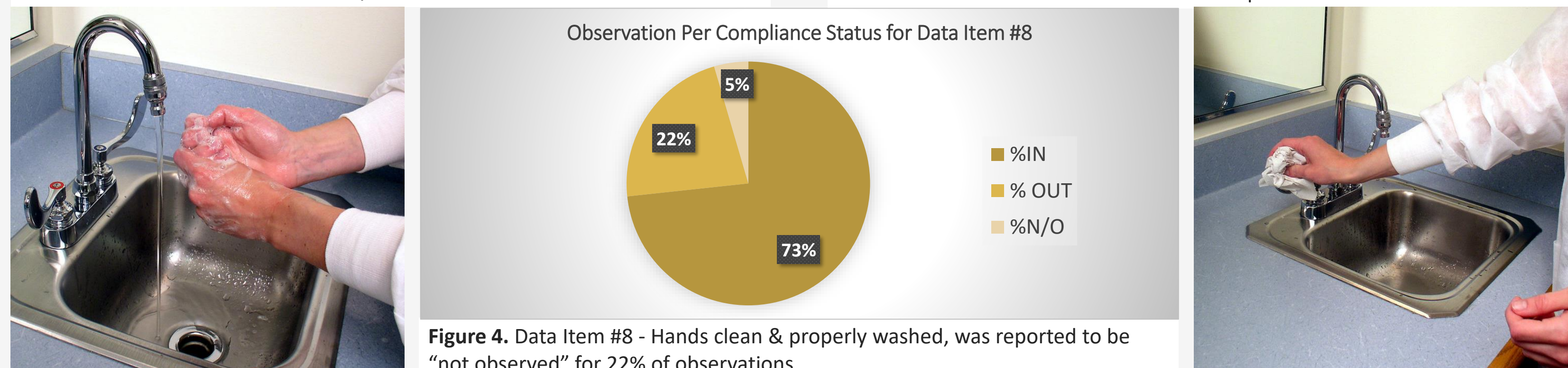


Figure 4. Data Item #8 - Hands clean & properly washed, was reported to be “not observed” for 22% of observations.

LIMITATIONS

- Out of 56 counties, 42 performed 786 inspections during the month of October in 2018. Only 19 counties submitted copies of 468 reports. Of those reports, only 398 qualified and were included in this study.
- Some counties utilized reports different from those of the Food and Consumer Safety Bureau (FCS) and therefore, needed to be converted.
- Counties with forms that did not have a data items for CFPM or V&D Procedures were required to make a note in the comments section on page 2 of the inspection report. Some reports contained this information while many others did not.
- Several reports contained missing marks and/or items that were marked IN but mentioned as OUT of compliance in the comments section. As a result, only data items with a marked compliance status were analyzed in this study.

CONCLUSION

The purpose of this study was to determine the most common risk factor violations observed in Montana retail food establishments, and what impact standardization and the presence of a CFPM has on the quantity and/or quality of reported violations. The results support the following:

- 77% of all observations were reported as in compliance and 3% were reported as out-of-compliance.
- The top risk factor violations were related to Improper Holding/Time and Temperature, Contamination, and Poor Personal Hygiene.
- Standardized counties reported more violations and repeat violations than non-standardized counties.
- Non-standardized counties reported more violations as corrected on site and more data items not observed.
- Retail food establishments with a CFPM were observed to have less risk factor violations than those without a CFPM present.
- 22% of Data Item #8 observations were being marked as “Not Observed”.

RECOMMENDATIONS

- Improvement needed three areas: Improper Holding/Time and Temperature, Contamination, and Poor Personal Hygiene.
- Standardizing retail food inspection personnel should be continued and encouraged to promote cohesiveness throughout Montana county health departments.
- CFPM requirements should be continued and encouraged to assist in reducing major risk factor violations.
- Reporting Data Item #8 as either IN or OUT of compliance should be encouraged due to its association to one of the five major risk factors contributing to foodborne illnesses.
- A Standard 9 Risk Factor Study should be conducted to obtain additional data for further analysis.

ACKNOWLEDGMENTS

I would like to thank the Food and Consumer Safety Section of the Montana Department of Public Health and Human Services for the opportunity to work in their office as a Summer Intern. A special thanks to Nina Heinzinger, Ed Evanson, and Alicia Love for providing the tools and resources needed to conduct this study. Thank you for your enthusiasm, encouragement, and guidance which has directed me through this study and has provided me with invaluable experiences.

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