

Research article

THE STATUS OF FOOD SAFETY AND HYGIENE IN THE KITCHENS OF SOME TEXTILE ESTABLISHMENTS IN THE NORTHERN VIETNAM, 2018

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ABSTRACT

Aims: To investigate the status of food safety and hygiene in 12 kitchens of garment companies.

Methods: A cross-sectional study used an observation and an interview method to identify the status of food safety and hygiene in 12 kitchens of garment companies in 5 northern provinces. Data collection included an observation of kitchens and people directly processing food and interview with processors according to questionnaires.

Results: Out of 12 kitchens, the study showed that 71.6% of kitchens at safe of hygiene condition. In term of basic condition, 79.2% reached the general standards; sanitation conditions was 70.1%; hygiene of equipment and instruments was 45.0%; hygiene of employees was 79.2%; food hygiene was 64.3%. In general, the food hygiene and safety conditions were basically met requirements, but only 50% of the kitchens were designed to process under one-direction principal as well as certified to meet the waste treatment standards; 25% had separate protective-clothing dressing room; 33% sufficiently had equipments for preventing harmful insects and animals. Sample storage cabinets only accounted for 33.3%; The kitchens stored food samples was very low (25%). However, only 50% kitchens had food supplier contracts.

Conclusions: There were 71.6% of the kitchens meeting the general conditions for food safety and hygiene, of which the legal rate was 79.2%. In general, the basic food hygiene and safety conditions were met, however, only 50% of the kitchens were designed according to the one-way principle as well as certified to meet the waste treatment standards. The implementation of sample storage according to regulations had not yet been paid attention to and strictly complied with, such as the fact that the facilities were equipped with ample storage devices and sample storage cabinets, only 33.3%.

Keywords: food safety and hygiene, kitchen, textile establishments

I. INTRODUCTION

The food unsafety in collective kitchens is one of the emerging concerns today in Vietnam. Unhygienic food is a source of dangerous disease transmission, causing acute and chronic poisoning and long-term accumulation of toxins in the body

leading to dangerous complications. It is estimated that 600 million people worldwide develop signs of illness after eating contaminated food, and 420,000 die each year, resulting in the loss of 33 million years of healthy life [1, 2].

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Currently, there are up to 400 diseases transmitted through unsafe food, mainly cholera, typhoid, and flu. Accordingly, food poisoning cases also tend to increase [3]. Nowadays, people use the phrase "burden of foodborne illness" to refer to the great relationship and influence of the issue of food safety and hygiene on human health and life. Although Vietnam has recently made a remarkable progress in ensuring food hygiene and safety, food safety management still has many weaknesses, limited resources, and has not met the requirements of the Ministry of Health. Food hygiene and safety are required especially in the kitchens of industrial parks and export processing zones with a highly concentrated workers. The workers' meals, which are already frugal, do not guarantee enough nutrients. The

consequences of not ensuring food hygiene and safety can lead to food poisoning, affecting workers' health, affecting labor productivity, economic development, and social security [4].

The reality of food poisoning cases occurring in industrial parks and factory zones shows that providing and organizing meals for workers should be paid attention to and checked regularly in textile enterprises with a large workforce. To have more basis for proactively preventing and overcoming food safety-related problems at collective kitchens in textile and garment establishments, we conducted a study to determine the current status of food safety and hygiene at the kitchens of some textile establishments in the northern Vietnam.

II. METHODS

2.1. Study design and subjects

A cross-sectional study was implemented from May 2017 to May 2018 in 12 collective kitchens of textile establishments in 5 provinces of Hai Duong, Hai Phong, Bac Ninh, Thai Nguyen, and Vinh Phuc.

2.2. The data collection

Data were collected using (i) a direct observation of kitchens and people directly processing food through the

2.3. Study variables

Legal achievement

When a collective kitchen achieves all 4 evaluation contents, including 3-step verification record, health examination record, record of confirm/update of food

General satisfaction with basic sanitary conditions

When a collective kitchen achieves all 12 evaluation contents, including the kitchen is designed according to the one-way principle; far from pollution sources;

Inclusion criteria: kitchens providing 100 or more meals per day at textile and garment establishments in 5 northern provinces have chosen in the study.

Exclusion criteria: companies's owners did not agree to participate in the study.

information collection form, and (ii) an interview with processors according to a questionnaire.

safety, and hygiene knowledge, they have a certificate of meeting waste treatment standards.

there is a changing room for labor protection; the floor does not stagnate water; have a drainage system; There is a ventilation system; separate toilets; have

insect prevention equipment; have a safe lighting system; have trash cans with lids;

General conditions of equipment and tools

When the collective kitchen achieves all 5 evaluation contents, including separate raw food containers; have equipment and tools to monitor product quality and

General attainment of the human condition

When the collective kitchen achieves all 4 practical evaluation contents, including staff wearing protective gear; cutting

General satisfaction with food hygiene conditions

When the collective kitchen achieved all 7 evaluation contents, including purchase and sale contract with the food supplier; the processing process ensures a one-way principle; carry out storage of food samples; sample retention time \geq

2.4. Statistical analysis

The survey data were cleaned and entered using Epidata 3.1 software and analyzed using SPSS 18.0 software. Use frequency and ratio (%) to describe qualitative variables

Evaluation of research results: Assess the pass/fail level based on the

2.5. Ethical issues

The ethical issues of the study were approved by the Ethics Committee in Biomedical Research of the Institute of Nutrition. The study participants have

hygienic canteen; food storage to ensure food safety and hygiene.

safety; have tools to store samples, cabinets to preserve samples; food production places have their wash basins; Use prescribed detergents.

nails short; do not wear jewelry; Wear gloves when handling cooked food.

24 hours (for establishments that store samples); perform 3-step verification; raw materials, additives, support substances, guaranteed preservation; Periodic water testing.

evaluation results of the main questions in the questionnaire and based on direct observations and interviews. Each sentence needs to meet the conditions to be evaluated as passing. Then calculate the percentage of the base pass for each of those questions.

explained the purpose, obligations, rights, and risks when participating in the study. Subjects voluntarily signed a commitment to participate in the study.

III. RESULTS

Table 1. Legal profile of collective kitchens (n=12)

Content	n	%
3-step verification profile	12	100
Health examination records	11	91.7
Dossier to confirm/update food safety knowledge	9	75
Have a certificate of meeting waste treatment standards	6	50
General achievement of legal records	9.5	79.2

Table 1 shows that the overall achievement of legal records was 79.2%, of which 100% of establishments had sufficient documents for 3-step

verification. Eleven (91.7%) out of 12 establishments had sufficient medical examination records. Records confirming knowledge on food safety

and hygiene only reached 75% and only 50% of investigation establishments had certificates of meeting waste treatment standards. These are mandatory documents required by establishments, but due to staffing problems that may not

be stable, the completion of the application was still delayed. In addition, waste treatment issues had not been paid enough attention and required the involvement of the relevant authorities in checking and reminding.

Table 2. *Sanitary conditions of facilities (n=12)*

Content	n	%
The kitchen is designed according to the one-way principle	6	50
Far from the pollution source	12	100
There is a changing room for labor protection	3	25
The floor does not stagnate in water	7	58.3
Has a drainage system	11	91.7
There is a ventilation system	7	58.3
Toilets are arranged separately	12	100
There is equipment to prevent insects	4	33.3
Have a safe lighting system	7	58.3
Has a trash can with a lid	11	91.7
The restaurant is hygienic	11	91.7
Food storage warehouse to ensure food hygiene and safety	10	83.3
General satisfaction with facility hygiene conditions	8.4	70.1

Table 2 shows sanitary conditions of facilities. Only a half of kitchens were designed according to the one-way principle. Most of the surveyed facilities had kitchens far from pollution sources, drainage systems, and separate toilets. There was a hygienic canteen, with lidded trash cans. Besides, the number of

establishments equipped with changing rooms for labor protection and equipment for insect prevention was very small with the corresponding rate of 25% and 33.3%. Only 58.3% of floor structures were not stagnant water, have ventilation and lighting systems.

Table 3. *Conditions of equipment and tools (n=12)*

Content	n	%
Separate utensils for raw and cooked food	7	58.3
Having equipment and tools to monitor product quality and safety	2	16.7
There are tools to store samples, cabinets to preserve samples	4	33.3
Food production places have their wash basins	4	33.3
Use detergents as prescribed	10	83.3
General satisfaction in terms of equipment and tools	7.8	45.0

Table 3 shows that the percentage of kitchens meeting the general condition of equipment and tools was quite low at 45%, in which the equipment with ingredients, additives, preservatives, and detergents by regulations was approved

by the regulations that the enterprises performed quite well with 100% and 83.3% respectively. Especially, only 33.3% of the kitchens are equipped with a separate hand wash basin at the

processing place, leading to the risk of microbial contamination of food.

Table 4. Human conditions (n=12)

Content	n	%
Do employees wear protective gear	10	83.3
Cut your nails short	12	100
Do not wear jewelry	9	75
Wear gloves when serving cooked food	7	58.3
General attainment of the human condition	9.5	79.2

Table 4 shows that the overall pass rate for the human condition was 79.2%. In which, 83.3% of employees wore protective clothing according to regulations. Most of the processing staff practiced quite good personal hygiene

with the rate of 100% employees cutting their nails short, 75% not wearing jewelry while processing. However, only 58.3% of food processors wore specialized gloves when dividing cooked food.

Table 5. Conditions on food hygiene (n=12)

Content	n	%
Contract of sale with a food supplier	6	50
The processing process ensures the one-way principle	5	41.7
Perform food sample saving	9	75
Sample retention time 24 hours (for establishments that store samples)	3	25
Implement 3-step verification	12	100
Raw materials, additives, support substances, guaranteed preservation	12	100
Routine water testing	7	58.3
General attainment of food hygiene conditions	7.7	64.3

Table 5 shows that the survey facilities achieved the overall sanitary condition of 64.3%. In which, 100% of the investigating establishments strictly implement the 3-step verification process as well as the use of raw materials, additives, support substances, and preservation in accordance with regulations.

Only 50% of kitchens had supply contracts with food suppliers. Only 58.3% of facilities performed periodic water testing. Notably, only 41.7% of the kitchens carried out the processing process to ensure the one-way principle, 75% of the establishments kept the samples, but only 25% of the establishments kept the samples within the specified time.

IV. DISCUSSION

In the results of this study, we have identified the status in ensuring food safety and hygiene in the kitchens of a 12 textile and garment establishments in the northern Vietnam, 2018. Only 50% of the kitchens are available. Food is

designed according to the principle of one-way. This rate is higher than the research results of author Hoang Tien Cuong and colleagues conducted at collective kitchens in industrial zones in Nam Dinh province in 2015 with the

results that only 38.5% of kitchens are designed according to the same principles. one-way switch [5]. Especially, only 25% of the surveyed kitchens have changing rooms for employees, only 33.3% of establishments have enough insect prevention equipment. These are risk factors for the loss of food safety and hygiene and businesses need to pay more attention and investment in their kitchens. The percentage of kitchens meeting the general conditions of equipment and tools in Table 3 shows that it is quite low at 45%, especially only 33.3% of the kitchens are equipped with a separate hand wash basin at the processing place, leading to risk of microbial contamination of food. According to a study by author Hoang Duc Hanh et al., conducted in 2010 investigating food poisoning cases in Hanoi, the cause was up to 20.5% of samples with E.Coli and 6.1% with S. Aureus [6]. Because the processor has frequent contact with raw food, there is a risk of microbial contamination, so kitchens need to add hand wash basins so that kitchen staff can wash their hands separately to avoid cross-contamination due to washing hands with people. food poisoning and food-borne illnesses. Besides, the activities of quality supervision and sample storage have not been paid enough attention by enterprises. Specifically, only 16.7% of enterprises are equipped with equipment and tools to monitor product quality and safety; 33.3% of enterprises have equipment to store samples, separate sample storage cabinets according to regulations. This is really a matter of concern and a risk factor for food safety and hygiene at the enterprise. The results show that 83.3% of employees wear protective clothing according to

regulations. This result is higher than the study of author Nguyen Van Dat and his colleagues in 2015 at the collective kitchens of enterprises in the Central region with the rate of 66.7% [7] or the results of Le Loi author. et al performed at the collective kitchens of enterprises in Nam Dinh province in 2018 was 63.8% [8]. Most of the processing staff practice quite good personal hygiene with the rate of 100% employees cutting their nails short, 75% not wearing jewelry while processing. However, only 58.3% of processors wear specialized gloves when dividing cooked food. This is a mandatory regulation to help reduce the risk of microbial contamination of cooked food from the hands of the processor. Table 5 shows that only 50% of kitchens have supply contracts with food suppliers. This rate is much lower than the research of author Tran Danh Phuong in Bac Ninh in 2013 of 82.1% [9] or the study of author Le Loi in Nam Dinh in 2018 of 92.3% [8].]. This can be explained by the fact that many businesses are still quite subjective and have a habit of taking food from markets or households, leading to no contract documents with suppliers. This is really a worrying issue that poses a risk of food insecurity when there is no legal basis as well as a certificate of guaranteed food origin. The percentage of collective kitchens meeting food safety and hygiene conditions is 71.6%. This rate is lower than the study by author Le Loi et al conducted at corporate canteens in Nam Dinh province in 2018 in which the overall achievement of food safety and hygiene conditions was 86.6%. In which, basic conditions reached 75.9%; equipment and tools reached 93.3%; human conditions reached 91.2% and food hygiene conditions reached 84.4% [8]. However, the research results have a

higher rate than that of the author Tran Van Dang and his colleagues conducted at the collective kitchens in Tra Vinh province in 2015 with 34.8% of the

collective kitchen establishments meeting the standard. event of food safety and hygiene according to regulations [10].

V. CONCLUSION

There are 71.6% of the kitchens meeting the general conditions for food safety and hygiene, of which the legal rate is 79.2%; the overall sanitary condition of the facility is 70.1%; the general condition of equipment and tools is 45.0%; the overall human condition is 79.2%; The overall achievement of food hygiene conditions is 64.3%.

In general, the basic food hygiene and safety conditions are met, however, only 50% of the kitchens are designed according to the one-way principle as well as certified to meet the waste treatment standards; only 25% of

establishments have separate protective working changing rooms for kitchen staff; Insect prevention equipment is not fully equipped, only 33.3%;

The implementation of sample storage according to regulations has not yet been paid attention to and strictly complied with, such as the fact that the facilities are equipped with ample storage devices and sample storage cabinets, only 33.3%; The facility that stores samples within the prescribed time are still very low, accounting for only 25%. 50% of establishments do not have a purchase contract with a food supplier.

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