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Research Article

Knowledge and practice of food safety of processors at some collective kitchens in Viet Yen industrial park district, Bac Giang province in 2022

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Abstract

Food safety in industrial park at collective kitchens depends greatly on the knowledge and practices of food processors. This study describes the knowledge and practices of food safety of processors at some collective kitchens in Viet Yen industrial park district, Bac Giang province in 2022. The results show that the general knowledge pass rate is 82.7%; including 100% knowledge about when to wash hands; Wear a mask, keep physical distance, infectious diseases are not allowed to participate in food processing. The overall practice pass rate is 82.7%; the highest scores were in working attire, hygienic practices in preparing and dividing food, compliance with using cutlery and cutting boards for separately cooked raw foods, and compliance with epidemic prevention measures at collective kitchens. Food safety knowledge and practices of processors at some collective kitchens industrial zones in Viet Yen district, Bac Giang province all passed a rate of over 80%. It is necessary to strengthen the organization of training, dissemination, and full updates of the State's regulations on food safety for people directly processing in industrial park at collective kitchens.

Keywords: *Food safety, collective kitchens, knowledge, practice.*

1. INTRODUCTION

With the trend of socio-economic development, many industrial parks and industrial clusters have been established, leading to the birth of a series of collective kitchens. Food safety at collective kitchens in industrial parks, schools are always an issue of concern to all

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levels, sectors and people [1]. Especially in the new situation of the COVID-19 epidemic, which is extremely complicated at home and abroad [2] .

Bac Giang province is not an exception to the general situation of the whole country, the issue of food safety at collective kitchens is of concern. Currently, the whole province has 295 businesses and 247 collective kitchens in operation, including: 47 collective kitchens organized by businesses to cook themselves, 63 collective kitchens are hired by businesses and individuals to cook and provide meals on site, the 137 kitchens that brought in meals from outside only organized meals for workers on site without cooking on site.

In 2021, the COVID-19 epidemic occurs globally with complicated developments. Food production and trading is different from the previous period, in addition to ensuring food hygiene and safety, businesses are places where many workers gather. Preventing and controlling the COVID-19 epidemic is extremely important, but production must still be ensured. Food safety at some collective kitchens in industrial park depends greatly on the knowledge and practices of those directly involved in all stages of the processing process until the distribution of meals to workers. So food processors have knowledge and good practice are a mandatory condition to ensure food safety conditions at collective kitchens in industrial park.

Up to now, there is no survey data to fully assess the food safety knowledge and practices of processors at collective kitchens Industrial Park in Bac Giang province in the new period. Starting from the reality of local food safety management, there is a need for a scientific basis to improve the effectiveness of food safety management at collective kitchens, we conduct research to evaluate knowledge, Food safety practices of processors at some collective kitchens industrial zones in Viet Yen district, Bac Giang province in 2022.

2. MATERIALS AND METHODS

2.1. Research subjects

Employees directly processing food (hereinafter referred to as processors) at collective kitchens in industrial parks in Viet Yen district, Bac Giang province were selected for the study;

* Criteria for selecting subjects for research:

- Are people directly involved in food processing and agree to participate in research;

* Exclusion criteria

- People refused to participate in the study.

2.2. Research Methods

2.2.1. Research design: Cross-sectional descriptive epidemiological study design.

2.2.2. Sample size and sampling method

- *Sample size:* apply the formula to calculate sample size for a proportion:

$$n = Z^2_{(1-\frac{\alpha}{2})} \frac{p.q}{d^2}$$

In there *:*

n = sample size

Z = confidence at threshold α= 0.05, $Z_{(1-\alpha/2)}$ = 1.96

p = proportion of people with correct perception. Research by author Nguyen Van Can [4] shows that the rate of achieving food safety knowledge of processors at collective kitchens is ≈ 70%, so p = 0.7;

q = 1- p = 0.3 and d = 0.05 is the desired error,

Applying the formula we have n = 322 people. Actually investigated 324 people.

Viet Yen District Industrial Park has 30 collective kitchens organized by businesses to cook on-site (type 1) and 50 collective kitchens organized by businesses hiring food service providers to cook on- site (type 2). Each collective kitchen randomly draws 3-5 processors to interview to meet the calculated sample size of 324 people.

2.2.3. Research variables

- Processors' knowledge of requirements and regulations that need to be met for food processors
- Percentage of processors who know about infectious diseases and are not allowed to participate in food processing
- Percentage of processors with correct knowledge about preserving and storing food samples
- Percentage of processors with correct knowledge about signs of food poisoning
- Knowledge attainment rate of food processors
- Percentage of processors who properly practice food safety regulations at collective kitchens
- Percentage of processors who correctly practice COVID-19 epidemic prevention measures

2.2.4. Techniques applied in research

Conduct knowledge interviews and practice observations of people directly involved in processing at collective kitchens about knowledge of food safety assurance according to the prepared knowledge and practice assessment toolkit, content includes:

- General information section: 7 sentences from H1 to H7
- Knowledge part: 28 questions from C1 to C28
- Practice part: 11 questions from C1 to C11

Knowledge questions are built based on the 2010 Food Safety Law, Decree No. 155/2018/ND-CP dated November 12, 2018 of the Government on amending and supplementing a number of regulations related to food safety regulations. business investment conditions under the state management of the Ministry of Health; Decision No. 37/QD-ATTP dated February 2, 2015 on promulgating training materials on food safety knowledge; set of questions to assess food safety knowledge for facility owners, people directly processing and providing food service businesses and answers; Official dispatch 965/ATTP-NDTT. Among the 30 questions in the questionnaire, number the questions from 1 to 30. Randomly draw among the 30 questions to select 24 questions as a knowledge assessment tool, along with 4 questions about knowledge. knowledge in preventing COVID-19 epidemic of people directly processing food.

The practical part is built based on 11 criteria on practices of people directly processing food during the processing process.

Knowledge assessment:

- If you can answer ≥80% of the questions (≥22 questions), your knowledge will be considered satisfactory.

- If you can answer < 80% of the questions (<22 questions), your knowledge will be considered unsatisfactory.

Practical assessment part:

- If the observed person correctly practices 11/11 criteria, the practice will be assessed as satisfactory;

- If the observed person practices incorrectly in 1 criterion or more, the practice will be assessed as unsatisfactory.

2.2.5. Data processing

Collected data are processed using SPSS 20.0 software. The results are calculated as percentages (%). Use frequency tables and graphs to present the results obtained.

3. RESULTS AND DISCUSSION

3.1. Food safety knowledge of processors at some collective kitchens industrial zones in Viet Yen district, Bac Giang province in 2022

Processors' knowledge of the requirements and regulations that need to be met for food processors is raised to a higher level, not only does it stop at participating in knowledge training, but it is necessary to be granted a certificate of food safety knowledge by a competent authority (Table 1).

Table 1. *Processor's knowledge of requirements and regulations that need to be met for food processors*

Correct knowledge	***Worked ≤ 1 year (n=111)***		***Worked for more than 1 year (n=213)***		***Total (n=324)***	
	SL	***%***	***SL***	***%***	***SL***	***%***
Issue health and knowledge certificates	111	100.0	213	100.0	324	100.0
Time to have a health check	89	80.2	185	86.9	274	84.6
Time to wash hands	111	100.0	213	100.0	324	100.0
Wear a mask when processing or having direct contact with food	111	100.0	213	100.0	324	100.0
Keep physical distance	111	100.0	213	100.0	324	100.0

100% of processors have correct knowledge about issuing health certificates and food safety knowledge, 100% know when to wash hands, which is before processing and after going to the toilet, this is a good practice. paramount in food processing to prevent

contamination. There is no difference between groups working for more than 1 year and less than 1 year. Research by author Truong Van Be Tu also shows that 91.96% have correct knowledge about when to wash hands [5]. 100% know the need to wear masks when processing or having direct contact with food and 100% have correct knowledge about keeping physical distance according to instructions from the Ministry of Health. Higher than the research results of author Nguyen Thi Thanh Nga, it shows that over 90% have correct knowledge about the need to wear masks when processing and contacting food; 89.6% know the need to keep physical distance while working [6] .

Diseases that people directly participating in food production, processing, and trading must not contract while producing and trading food have been specifically stipulated in Clause 2, Article 2 of Decree No. 155/2018/ND-CP November 12, 2018 of the Government. The results of our research are shown in Table 2.

Table 2. *Percentage of processors who know about infectious diseases and are not allowed to participate in food processing*

Correct knowledge	***Worked ≤ 1 year (n=111)***		***Worked for more than 1 year (n=213)***		***Total (n=324)***	
	Number	***%***	***Number***	***%***	***Number***	***%***
People with acute respiratory infections or progressive tuberculosis are not allowed to participate in TP processing	111	100.0	213	100.0	324	100.0
If you have a gastrointestinal infectious disease or acute diarrhea, you are not allowed to continue working	111	100.0	213	100.0	324	100.0
If you have acute infectious dermatitis, you are not allowed to continue working	95	85.6	184	86.4	279	86.1
When there is at least one of the symptoms of cough, fever, difficulty breathing, do not work at the facility	111	100.0	213	100.0	324	100.0

100% of processors have correct knowledge that people with acute respiratory infections or progressive tuberculosis are not allowed to participate in food processing and people with infectious diseases through the digestive tract, acute diarrhea, do not continue working. 100% have correct knowledge about the content when having at least one of the symptoms of cough, fever, shortness of breath and are not allowed to work at the facility. There is no difference between groups working for more than 1 year and less than 1 year. This result is higher than the research results of author Nguyen Van Tu showing that the

knowledge of processors about some diseases that cannot be processed when food is processed is viral hepatitis with 52.6%, respiratory tract infections with 52.6%. acute respiratory infections 48.9%, diarrhea, cholera, dysentery, typhoid (31.4%), and infected skin lesions (28.0%) [7] .

Proper food preservation after processing is an important factor to ensure everyone's safety and health. When not properly preserved, food can become contaminated, lose quality and pose a health hazard. Subjects' correct knowledge about preserving and storing food samples is shown in Table 3.

Table 3. *Percentage of processors with correct knowledge about preserving and storing food samples*

Correct knowledge	***Worked ≤ 1 year (n=111)***		***Worked for more than 1 year (n=213)***		***Total (n=324)***	
	Number	***%***	***Number***	***%***	***Number***	***%***
Conditions in food preservation	107	96.4	209	98.1	316	97.5
Measures to destroy disease-causing bacteria	105	94.6	207	97.2	312	96.3
Maximum time to leave prepared food at room temperature	87	78.4	181	85.0	268	82.7
Food sample retention time	98	88.3	206	96.7	304	93.8
Food sample storage temperature	97	87.4	210	98.6	307	94.8
Defrost food	98	88.3	208	97.7	306	94.4

The results in Table 3 show that 97.5% of processors have correct knowledge about conditions to ensure food preservation; 96.3% have correct knowledge about measures to kill common disease-causing bacteria, 82.7% have correct knowledge about the maximum time to leave processed food at room temperature; 93.8% have correct knowledge about food sample storage time; 94.8% had correct knowledge about food sample storage temperature and 94.4% had correct knowledge about properly defrosting food. There is no difference between groups working for more than 1 year and less than 1 year. This result is higher than the research results of author Nguyen Thi Lan Huong's in 12 kitchens of garment companies in 5 Northern provinces, showing that the proportion of processors with correct knowledge about food sample storage is 73.5% and knowing about food sample retention time is 57.1% [8] .

Our research results (Table 4) show that the majority of processors have correct knowledge about important signs of food poisoning such as diarrhea, abdominal pain, vomiting, nausea, and neurological signs.

Table 4. *Percentage of processors with correct knowledge about signs of food poisoning*

Correct knowledge of important signs of food poisoning	***Worked ≤ 1 year (n=111)***		***Worked for more than 1 year (n=213)***		***Total (n=324)***	
	Number	***%***	***Number***	***%***	***Number***	***%***
Diarrhea	111	100.0	213	100.0	324	100.0
Vomiting, nausea	78	70.3	164	77.0	242	74.7
Stomach-ache	88	79.3	179	84.0	267	82.4
Tired	75	67.6	151	70.9	226	69.8
Neurological signs	77	69.4	178	83.6	255	78.7

This result is lower than the research results of author Truong Van Be Tu's showing that 97.32% of processors have correct knowledge about the symptoms of food poisoning such as vomiting, diarrhea, headache, pain. abdomen, convulsions [5] .

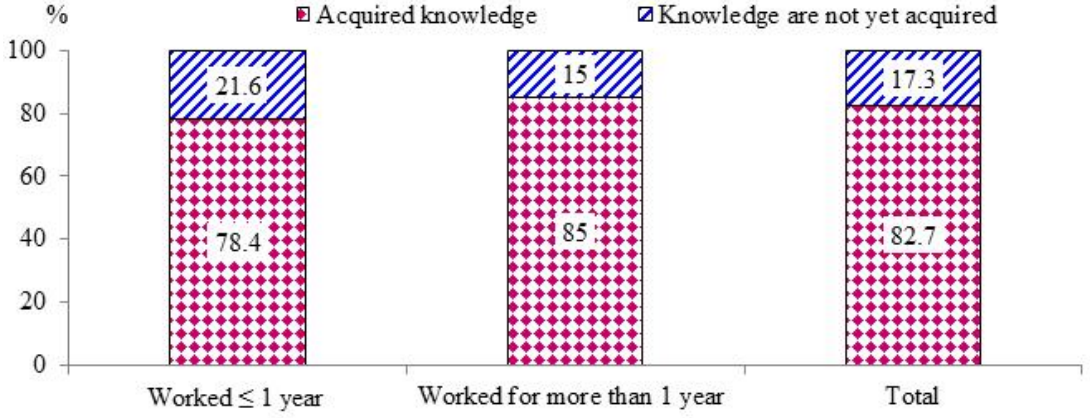

Figure 1. *Knowledge pass rate of food processors (n=324)*

The results of the chart in Figure 1 show that the general knowledge attainment rate of food processors is 82.7%. This result is quite similar to author Nguyen Thanh Long research showing that the proportion of processors with correct knowledge about food safety is 79.1% [9] . Lower than the research results of author Nguyen Van Tu with the general knowledge attainment rate of 86.3% [7] . At the same time, it is lower than the target in the National Food Safety Strategy for the period 2011-2020 and vision 2030 approved by the Prime Minister (by 2020, 95% of food producers, processors, and traders have knowledge and practice of food safety.). Therefore, it is necessary to periodically organize training sessions every 3-6 months to update food safety knowledge for processors to contribute to ensuring food hygiene and safety.

3.2. Food safety practices of processors at some collective kitchens industrial zones in Viet Yen district, Bac Giang province in 2022

Processors' practices are evaluated according to the contents of food safety regulations at collective kitchens: working attire, hygienic practices in processing, food division... (Table 5) and food preparation on measures to prevent the COVID-19 epidemic (Table 6).

Table 5. *Percentage of processors who properly practice food safety regulations at collective kitchens*

Practice correctly	*Worked ≤ 1 year (n=111)*		*Worked for more than 1 year (n=213)*		*Total (n=324)*	
	Number	*%*	*Number*	*%*	*Number*	*%*
Use separate cutting boards for raw and cooked foods	104	93.7	213	100.0	317	97.8
Have hats and aprons when processing and serving	89	80.2	176	82.6	265	81.8
Do not use your hands to directly pick up food	111	100.0	213	100.0	324	100.0
Do not smoke and chew candy	111	100.0	213	100.0	324	100.0
Do not wear jewelry	111	100.0	204	95.8	315	97.2
Don't keep your nails long	111	100.0	213	100.0	324	100.0

The results of Table 5 show that 100% of cooks do not use their hands to directly pick up food; 100% do not smoke, chew candy while preparing, do not have long nails. 97.8% complied with using cutting boards for raw and cooked foods separately. 81.8% use hats and aprons when processing and serving. There is no difference between groups working for more than 1 year and less than 1 year. This result is similar to the research results of author Luu Thi Minh Ly with a rate of 100% achieving good practices in separately preserving raw and cooked foods; Use separate containers, tongs, knives, and cutting boards for cooked and raw food; At the same time, similar to research by author Nguyen Thi Tham, 91.3% use separate utensils for raw and cooked foods [10].

Table 6. *Percentage of processors correctly practicing COVID-19 epidemic prevention measures*

Practice correctly	*Worked ≤ 1 year (n=111)*		*Worked for more than 1 year (n=213)*		*Total (n=324)*	
	Number	*%*	*Number*	*%*	*Number*	*%*
Do not gather in large numbers at the workplace	111	100.0	213	100.0	324	100.0
Keep physical distance	111	100.0	213	100.0	324	100.0
If you have a cough, fever, or difficulty breathing, do not work at the facility	111	100.0	207	97.2	318	98.1
Wash your hands at the right time and with the right steps	109	98.2	206	96.7	315	97.2
Wear a mask when processing and serving	110	99.1	206	96.7	316	97.5

5K are COVID-19 infection prevention measures recommended by the World Health Organization for all people around the world to prevent the rapid spread of the COVID-19 pandemic. In our research, processors at collective kitchens also strictly implemented these regulations, 100% of subjects did not gather or gather in large groups at work; always keep distance from other employees. 97.2% practice hand washing at the right time and in the right steps and 97.5% wear masks when preparing and serving.

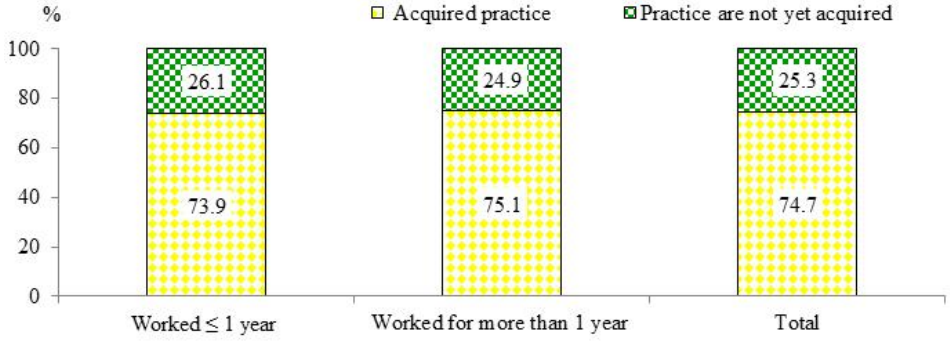

Figure 2. *Practice achievement rate of food processors at collective kitchens (n=324)*

Figure 2 shows that the general practice achievement rate is quite high at 82.7%; The highest priority is not to directly pick up food with your hands; Do not smoke and chew candy while preparing, do not have long nails, use cutting boards for separately cooked raw foods and comply with COVID-19 epidemic prevention measures at collective kitchens. Similar to the research results of some authors such as research by author Nguyen Thanh Long at businesses collective kitchens in Hung Yen province with an overall practice rate of 77.9% [9]. Research by author Nguyen Thi Tham on 231 food processors working at 59 collective kitchens in Hai Duong city showed that 75.3% of processors met the practice [10].

It can be seen that the knowledge and practice rate of processors in the study is relatively high, this is not only because they are self-aware of having to follow the provisions of the law to produce, process, and serve safe food, but also due to the close direction of the board of directors and industrial park management board, all companies appoint officers in the board of directors to directly direct on duty at the company at noon to monitor at collective kitchens operations.

4. CONCLUSION

Evaluating practical knowledge on 324 processors, the results showed that the overall rate of knowledge and practice was 82.7%; however, knowledge about signs of food poisoning and the practice of wearing hats and aprons when processing and serving is not high. There is no difference in knowledge and practice according to the working time of processors at some collective kitchens in Viet Yen industrial zone, Bac Giang province. It is necessary to strengthen communication work to improve the knowledge and practices of food processors at collective kitchens.

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