

# Sanitary Hygiene Analysis and the Presence of *Escherichia coli* at the White Tofu Making Place in Majasari Village, South Prabumulih District

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**Abstract— Background:** Tofu even though it is cheap and simple in shape, it turns out that tofu has a special quality in terms of nutrition. In the process of making tofu has a high risk of physical, chemical and biological hazards so that it can cause health problems to people who consume tofu. *Escherichia coli* bacteria are bacteria that are very close to the tofu making process. This bacterium is one of the causes of diarrhea that is often found in society. Not only children, but the elderly can also get this disease. **Method:** This research is descriptive. This study was conducted to analyze sanitary hygiene and place facilities in the manufacture of white tofu which includes sanitary hygiene, place sanitation facilities, personal hygiene, tofu processing, and packaging of white tofu. **Results:** From this study, sanitary hygiene and place facilities for making white tofu were obtained which include sanitary hygiene, place sanitation facilities, personal hygiene, tofu processing, and packaging of white tofu meet health requirements according to the Minister of Health of the Republic of Indonesia Number 1096 of 2011. On analysis the presence of *Escherichia coli* was not found in white tofu in Majasari Village, South Prabumulih District. **Conclusion:** From this study, it was found that Sanitary Hygiene meets health requirements and no *Escherichia coli* was found at the White Tofu Making Place in Majasari Village, South Prabumulih District.

**Keywords—** White Tofu, Sanitary Hygiene, *Escherichia coli*.

## I. INTRODUCTION

Tofu a traditional food that contains a high-quality source of protein because it contains a lot of essential amino acids. A vegetable protein contained in tofu is of higher quality than protein sourced from animals such as milk, eggs, and meat or often known as animal protein. The protein content contained in this tofu is almost equivalent to meat. Almost all people consume tofu, besides that the processing of soybean ingredients is very easy to do and does not require someone to have special skills or have special skills in managing it (1).

Tofu is one of the foods that are often consumed by the People of Indonesia, food is a basic human need that is a basic human need so that it is a form of human rights in every society. Therefore, its availability must be sufficient for safety, quality, nutritional content, and prices that are affordable to the public (2). The home industry, which is almost all raw materials sourced domestically, is sold domestically, and is consumed by the wider community, thus contributing to the economy of small and medium-sized people. One example is the tofu processing industry which is a small and medium-sized household industry that produces large amounts of waste, both in solid and liquid form, which can have an impact on the environment if not handled properly (3). A food pollution is one of the causes of health problems in the body. There are so many things that can cause unsafe food, one of which is contamination through the tools used, materials used and water (4).

According to Friis, García-b, Bang-berthelsen, & Hansen (2022) Good food management and meeting health requirements with one of the efforts to achieve an optimal

level of public health, so it needs attention in terms of nutritional value, in terms of purity, and in terms of hygiene. Because even though the nutritional value and purity are good, the cleanliness of the environment is not monitored and maintained, the food can cause diseases due to contamination.

The hygiene of the tofumaking place in Majasari Village, South Prabumulih District, is still not good. This can be seen from the unavailability of handwashing facilities equipped with soap, the condition of the building and facilities are still not good so that it is near the waterways. The raw material processing site is also open, there is only a roof without a ceiling while the walls are only sober. The source of clean water comes from the borehole water, and the wastewater is only allowed to flow into the got-got around the industry. For the disposal of tofu waste is accommodated and becomes animal feed such as cows, goats, sheep and others.

*Escherichia coli* is a bacterium that is very close to our daily lives (6). In the water analysis test, *Escherichia coli* is a microorganism that is used as an indicator to test for water and food pollution. The absence of these bacteria in water and food identifies the terms of water and food that are recommended for consumption. (7).

## II. METHOD

This research is a descriptive qualitative research. The process of collecting data collected is not numerical or statistical by means of other quantification, but the data collected is in the form of manuscripts, literature, research journals, scientific journals, interviews and observations. Qualitative research is more focused or focused on the observation and social practice of a phenomenon, which

dives deeper into the information of the behavior by paying attention to the existing structure and making the most of the triangulation of data (8)

This study was conducted to analyze sanitary hygiene and place facilities in the manufacture of white tofu which includes sanitary hygiene, place sanitation facilities, personal hygiene, tofu processing, and packaging of white tofu.

### III. RESULTS

#### 1. Water Source

TABLE 1. Analisis Water Source at the White Tofu Making Place, Majasari Village, South Prabumulih District

No	Respondents	Appropriate Aspects	%	Non-Conforming Aspects	%
1	H	5	71,43	2	28,57
2	D	7	100	0	0
3	R	7	100	0	0
4	S	7	100	0	0
5	A	7	100	0	0
6	W	6	85,71	1	14,29
7	I	5	71,43	2	28,57
Total		44	89,80	5	10,20

Source: Primary Data

Analisis water source at the White Tofu Making Place, Majasari Village, South Prabumulih District, obtained that most of it is Very Good, which is 89.80%.

#### 2. Facility Sanitation

TABLE 2. Analisis Fasilitas Sanitation at the Place of Making White Tofu, Majasari Village, South Prabumulih District

No	Respondents	Appropriate Aspects	%	Non-Conforming Aspects	%
1	H	8	100	0	0
2	D	6	100	0	0
3	R	8	100	0	0
4	S	8	100	0	0
5	A	8	100	0	0
6	W	4	100	0	0
7	I	3	75	1	25
Total		45	96,43	1	3,57

Source: Primary Data

Based on the table above, Analisis Fasilitas Sanitation at the White Tofu Making Place in Majasari Village, South Prabumulih District is in the Very Good category of 45 (96.43%), while Fasilitas Sanitation at the Place of Making White Tofu, Majasari Village, Prabumulih District South in the Very Less category by 1 (3.57%).

#### 3. Personal Hygiene

TABLE 3. Analisis Personal Hygiene at the White Tofu Making Place, Majasari Village, South Prabumulih District

No	Respondents	Appropriate Aspects	%	Non-Conforming Aspects	%
1	H	9	69,23	4	30,77
2	D	4	80	1	20
3	R	8	61,54	5	38,46
4	S	7	53,85	6	46,15
5	A	8	61,54	5	38,46
6	W	2	100	0	0
7	I	1	50	1	50
Total		39	68,02	22	31,98

Source: Primary Data

Based on table 3 above Personal Hygiene, most of the 39 (68.02%) are in the good category, as many as 22 (31.98%) are in the Personal Hygiene category less.

#### 4. Processing

TABLE 4. Analisis processing at the White Tofu Making Place, Majasari Village, South Prabumulih District

No	Respondents	Appropriate Aspects	%	Non-Conforming Aspects	%
1	H	6	100	0	0
2	D	3	100	0	0
3	R	6	100	0	0
4	S	5	83,33	1	16,67
5	A	6	100	0	0
6	W	2	66,67	1	33,33
7	I	2	66,67	1	33,33
Total		30	88,10	3	11,90

Source: Primary Data

Based on table 4 above, the processing at the White Tofu Manufacturing Site in Majasari Village, South Prabumulih District, respondents were mostly 30 (88.10%) in the very good category, and very poor only 3 (11.90%).

#### 5. Packaging

TABLE 5. Analisis Pengemasan at the Place of Making White Tofu, Majasari Village, South Prabumulih District

No	Respondents	Appropriate Aspects	%	Non-Conforming Aspects	%
1	H	6	100	0	0
2	D	3	100	0	0
3	R	6	100	0	0
4	S	6	100	0	0
5	A	6	100	0	0
6	W	3	100	0	0
7	I	3	100	0	0
Total		33	100	0	0

Source: Primary Data

Based on table 5 above, Analisis Pengemasan at the White Tofu Making Place in Majasari Village, South Prabumulih District, all respondents in the excellent category were 33 (100%).

#### 6. Presence of Escherichia coli

TABLE 6. The existence of *Escherichia coli* at the White Tofu Making Place in Majasari Village, South Prabumulih District

No	Sample Code	Sample Location	Result	Quality Standards Permenkes RI No 1096/Menkes/PER/VI/2011
1	36969	Tofu 1	Negatif	ALT <i>Escherichia coli</i> : 0 CFU/gr
2	36970	Tofu 2	Negatif	ALT <i>Escherichia coli</i> : 0 CFU/gr

Source: Primary Data

Based on table 6 above that the existence of *Escherichia coli* at the White Tofu Making Place in Majasari Village, South Prabumulih District, all tofu samples tested by the laboratory at the Palembang Health Laboratory Center had negative results which means quality standards in the category according to the standards of the Minister of Health of the Republic of Indonesia No. 1096 / Menkes / PER / VI / 2011, namely ALT *Escherichia coli*: 0 CFU / gr.

IV. DISCUSSION

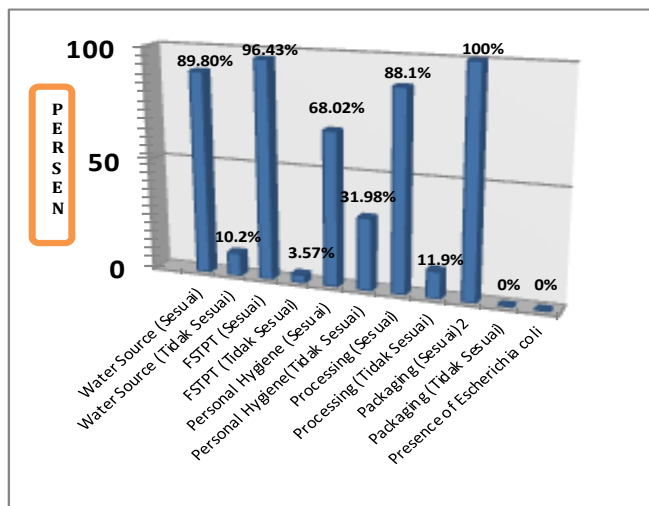


Figure 1 Average Analysis of Sanitary Hygiene and the Presence of *Escherichia coli* at the white tofu making site in Majasari village, South Prabumulih district

1. Water Source

Based on figure 1 of the distribution of Sanitary Hygiene Analysis at the white tofu manufacturing site in Majasari sub-district, South Prabumulih district, it shows the average water source coming from BOR wells. The distance of access to water sources reaches, the quantity of water is adequate, there is an inspection of water sources, monitoring from puskesmas on water sources and the existence of water source treatment before use. The results of the water source that answers the suitability or very good 89.80% which means that the water source in this study is in accordance with the standards of the Minister of Health of the Republic of Indonesia No. 1096 / Menkes / PER / VI / 2011. The results of this study were strengthened by the research of Sari Anggun Cahya Wulan (2018) which stated that the water source in making white tofu is better to use drilled wells so that it is slightly affected by contamination. Generally, this water is free from microbiological fouling and can be directly used as drinking water. According to Cicik Sudaryantiningsih, Yonathan Suryo Pambudi (2022) water is the most important element for the food processing process that is well used for purposes during product handling and processing. According to Desi Trisnawati, Dadan Ahmad Hudaya, Tuti Rostianti, Rudi Purwantoro (2022) the importance of clean water sources in the process of washing materials and washing hands to prevent contamination.

2. Facility Sanitation

Based on figure 1 distribution of analysis of sanitation facilities that are the availability of sanitation facilities such as the presence of toilets or toilets, the distance between latrines and water sources ± 10 meters, the presence of drainage, water availability, trash cans, garbage disposal mechanisms, sterile from vectors, hand washing stations, according to data obtained in this study is very good 96.43%. This research is in accordance with the Minister of Health of the Republic of

Indonesia Number 1096 of 2011 concerning the hygiene of sanitary services, sanitation facilities must meet health requirements which include hand washing stations, clean water, latrines, bathrooms and trash cans. In accordance with the opinion of Nazahah Hunafa, Narwati, Winarko (2022) who stated that contamination occurs after carrying out activities that can cause contamination of the hands, such as removing garbage. As per Xiang's opinion, Sun-waterhouse, Waterhouse, & Cui (2019) Microbial contaminants can be in food through various intermediate media including insects, mice, equipment and humans who handle the food are usually the main intermediaries. Proven in the research liu et al (2022) is a vector of the spread of foodborne diseases. Therefore, personal hygiene can be achieved if in oneself is embedded the importance of maintaining health and personal hygiene so as to produce good food quality.

3. Personal Hygiene

Based on figure 1 of the distribution of Sanitary Hygiene Analysis at the white tofu making place in Majasari sub-district, Prabumulih Selatan district, it shows the average Personal Hygiene which comes from personal health checks, attending training, changing clothes, wearing PPE, washing hands, washing hands with soap and in the sink, cutting nails, bathing, using jewelry such as rings, bracelets, watches when processing food. From the data obtained in this study, Personal Hygiene was good at 68.02% and the lack of Personal Hygiene was 31.98%. According to the Minister of Health of the Republic of Indonesia Number 1096 of 2011 concerning the hygiene of sanitation services, food handlers are people who are directly related to the food management process at the white tofu manufacturing place in Majasari village, South Prabumulih District by paying attention to the health condition of the handler, the use of PPE in food processing, and the behavior of handlers during food processing. In accordance with the opinion of Nazahah Hunafa, Narwati, Winarko (2022) Hygiene is a health effort to protect and maintain with the aim of improving the degree of health of the body and soul, with a general and individual scope. Strengthened by the opinion of Rina Fauziah (2022) who stated That individual hygiene is an action to maintain one's hygiene and health for physical and psychological well-being, strengthened by Anis Safety research; Agus Kharmayana Rubaya; Sigid Sudaryanto (2022) Good hygiene and personal hygiene of every food handler worker is very important to pay attention to because if workers do not maintain their cleanliness, then food can be contaminated. Elfariyanti (2021) stated that procedures are very important for food handlers, these procedures are individual hygiene and healthy living habits such as always maintaining hand hygiene by washing hands with running water and soap whenever hands are dirty, nail hygiene and using gloves. This is in line with research conducted by Cicik Sudaryantiningsih, Yonathan Suryo Pambudi (2022) where washing hands with water and soap will avoid being contaminated with bacteria. According to Agnes Rantesalu, Winioliski L.O. Rohi Bire (2022) there are four aspects that can affect food safety, one of which is physical contaminants are foreign objects contained in food, even though these



objects are not part of the food ingredients. Such as using jewelry such as rings, bracelets, watches when processing food can cause contaminants. According to Trisnawati, Rostianti, Purwantoro, Utami, & Cibaliung (2022) Personal Hygiene is important because body parts such as hands, hair, nose and mouth are microbial entry points to contaminate food during preparation, processing and serving through touch and breathing.

#### 4. Processing

Based on figure 1 distribution of analysis processing in this study which includes the manufacturing process, monitoring (Monitoring, Checking, Sampling) on the processing of tofu by related, Guidance and Direction in accordance with the Minister of Health on Sanitary Hygiene of Boga Services, knowing the source of raw materials, there are special areas in the preparation and processing of food, efforts to prevent and control vectors, washing with clean, running water. According to the data obtained in this study, it is very good 88.10%. This research is in accordance with the Minister of Health of the Republic of Indonesia Number 1096 of 2011 concerning the sanitary hygiene of jasaboga, processing must meet health requirements which include in food management there are technical requirements to determine the eligibility of the jasaboga. Food management at the white tofu manufacturing site that has an input component of technical requirements. Sari, Sujana, Setyawati, Anggorowati, & Artiyani (2022) the selection of raw material sources is very important, in making tofu, the soybean selection stage is one of the determinants of the final result of tofu products. According to Xiang et al (2019) stated the occurrence of contamination caused by the process at the time of the product processing process. Strengthened by Rina Fauziah (2022) food sanitation is a preventive effort that emphasizes the necessary activities and actions to be able to free food and beverages from all dangers that can interfere with health starting from before the food is produced, during the process of processing, storage, transportation, sales until the moment when the food and drinks are consumed. According to Huang et al (2022) Sanitation of food is restricted related to food processing which includes sanitation of clean water, sanitation of equipment and sanitation of points of sale. Sanitation has the purpose of trying to live a healthy way of life so as to avoid disease. But in its application, it has a different meaning, namely the sanitation business focuses more on environmental factors. According to Miasur et al (2021), what causes low sanitation and hygiene quality in household-scale food businesses in Indonesia is due to the lack of socialization of government regulations on good food production methods, weak coaching and supervision processes and evaluations from related government agencies that are less than optimal.

#### 5. Packaging

Based on figure 1 distribution of analysis Packaging which includes using crackle or plastic and gloves on packaging, special packaging places, Knowledge of safe tofu conditions, handling of tofu waste that is no longer feasible, packaging must be hygienic. According to the data obtained in this study

is very good 100%. This research is in accordance with the Minister of Health of the Republic of Indonesia Number 1096 of 2011 concerning sanitary hygiene of jasaboga, packaging must meet health requirements. According to Fajriansyah (2017) A good packaging process should be packaged using special tools so that food does not experience direct contact with hands. According to Tkaczewska et al (2023) Food should be served in a clean place, have good air circulation, handlers are dressed clean, neat, with aprons and head coverings and the absence of direct contact with the food served. According to Trisnawati, Rostianti, Purwantoro, Utami, & Cibaliung (2022) The criteria to consider in choosing food packaging are Stability of food, for example chemical decomposition, biochemistry, microbiological reactions that can occur. The environmental conditions of the food during the distribution and storage process such as ambient temperature and humidity are very important environmental factors, because these factors will determine the barrier properties required for packaging. The method or method of preserving food chosen, for example, this process can enter the human body because it is insoluble, so that if there is accumulation in the body, it will cause cancer.

#### 6. Presence of *Escherichia coli*

Based on figure 1 in this study, the results of laboratory testing on samples 36969 and 36970 were negative which means that there was no *Escherichia coli* in the white tofu that was examined and according to the standards of the Minister of Health of the Republic of Indonesia No. 1096 / Menkes / PER / VI / 2011, namely ALT *Escherichia coli*: 0 CFU / gr. According to Radi, all (2021) *Escherichia coli* can be controlled or eliminated by maintaining sanitary hygiene in white tofu, namely from water sources, sanitation facilities and personal hygiene, processing and packaging. Meanwhile, according to Endersen & Coffey (2020) The spread of *E. coli* can occur by direct contact (contact, shaking hands, and so on) then passed on through the mouth, but *E.coli* can also be found scattered in the nature around us. Passive spread can occur through food or drink.

### V. CONCLUSION

Based on the research that has been carried out, it can be concluded that the Analysis of Sanitary Hygiene and the Presence of *Escherichia coli* at the Place of Making White Tofu in Majasari Village, South Prabumulih District, is in accordance with the standards of the Minister of Health of the Republic of Indonesia No. 1096 / Menkes / PER / VI / 2011:

1. The water source at the White Tofu Making Place in Majasari Village, South Prabumulih District, is Very Good, which is 89.80%.
2. Fasilitas Sanitation at the Place of Making White Tofu, Majasari Village, South Prabumulih District, is in the Very Good category of 96.43%.
3. Personal Hygiene at the White Tofu Making Place in Majasari Village, Prabumulih Selatan Baik District, which is 68.02%.
4. Processing at the White Tofu Manufacturing Site, Majasari Village, South Prabumulih District, is very good 88.10%.

5. Pengemasan at the White Tofu Making Place, Majasari Village, South Prabumulih District, is very good as much as 100%.
6. The existence of *Escherichia coli* at the White Tofu Making Place in Majasari Village, South Prabumulih District, all tofu samples tested by the laboratory at the Palembang Health Laboratory Center had negative results which means quality standards in the category according to the standards of the Minister of Health of the Republic of Indonesia No. 1096 / Menkes / PER / VI / 2011, namely ALT *Escherichia coli*: 0 CFU / gr.

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