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Epidemiological Investigation Report of Food Poisoning in Banjarsari, Kanigoro District, Blitar Regency, 2025

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Abstract
Introduction: *Food poisoning is still one of the causes of extraordinary events (KLB) that often occur in community activities, especially at events with large amounts of food processing. Epidemiological investigations are necessary to identify patterns of occurrence, risk factors, and possible sources of exposure.* ***Objective:*** *This study aims to describe the pattern of occurrences, analyze risk factors, and identify possible sources of food poisoning in KLB in Banjarsari Village, Kanigoro District in 2025.* ***Method:*** *A descriptive observational investigation used case interviews, epidemic curve analysis, attack rate and attack rate ratio calculations, laboratory testing of food remnants, and observations.* ***Result and Discussion:*** *The epidemic curve indicated a common-source outbreak, with incubation periods ranging from 4 to 29 hours. Several foods showed high attack rates, but attack rate ratios were close to one, indicating no single dominant food source. Laboratory tests of three food samples were negative for pathogenic bacteria, although sample limitations and the absence of clinical specimens reduced interpretation. Environmental assessment identified unsafe food processing and storage practices.* ***Conclusion:*** *The incidence of food poisoning in Banjarsari Village, Kanigoro District in 2025 is a common source outbreak that is most likely caused by a combination of food processing factors that do not meet sanitary hygiene standards, inappropriate food storage, and risky environmental conditions, even though laboratory test results show negative results.*

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Introduction

Foodborne diseases are still one of the public health problems because food can be a medium for the transmission of biological and chemical agents (Wastutiningsih et al., 2025); (Ruslin et al., 2026). Food contamination can cause various health problems, ranging from mild symptoms such as nausea, vomiting, headache, abdominal pain, diarrhea, dehydration, and weakness, to severe conditions that have the potential to cause death (Safira, 2021). Incidents of food poisoning are also often unrecorded or underreported, especially in developing countries, so the actual burden of disease is estimated to be greater than the available data. Causative agents that are often found include Escherichia coli and Salmonella sp., which can contaminate food from the stage of production, processing, storage, to presentation (Daniswara et al., 2025); (SUDARYANTININGSIH & Pambudi, 2021); (Rahmadani, Sinaga, Qomariyyah, & Sunarti, 2025). The risk of food poisoning can increase in community activities that involve the provision of large amounts of food, such as celebrations, family gatherings, religious activities, and parties. In this activity, food goes through various stages, ranging from the selection of raw materials, washing, processing, storage, transportation, to presentation. Unsafe water use, poor hand hygiene, unhygienic processing processes, storage at inappropriate temperatures, cross-contamination, and too long time intervals between processing and consumption can increase the risk of growth and spread of pathogenic microorganisms (Sibuea, Sihombing, Daniela, & Pandiangan, 2025); (Rizky, Darmawan, & Rahmadiyani, 2026).

An Extraordinary Occurrence (KLB) of a foodborne outbreak is an occurrence when two or more people experience the same or similar symptoms after consuming the same food, and the food is then proven to be a source of exposure through epidemiological investigations. In community activities, the risk of KLB can increase if food is prepared en masse by food handlers who have not adequately applied hygiene and sanitation principles. Therefore, epidemiological investigations are needed to determine the number and characteristics of cases, identify suspected foods as sources of exposure, assess risk factors, and establish control measures to prevent the occurrence from spreading or recurrence (Maemuna, Lestari, & Akifah, 2026); (Handayani et al., 2023); (Nugrahaeni & Pertiwi, 2020). Regulatively, KLB is defined as the occurrence or increase in epidemiologically significant illnesses and/or deaths in an area over a certain period of time and has the potential to develop into an outbreak (Koban, 2005). The determination and management of KLB refers to the Regulation of the Minister of Health of the Republic of Indonesia Number 1501 of 2010 as well as the guidelines for the Early Warning System and Response to Potential Diseases/Outbreaks. The framework emphasizes the importance of rapid reporting, case verification, epidemiological investigation, specimen collection, exposure source control, and the implementation of food hygiene and sanitation at all stages of food management.

On Saturday, June 28, 2025 at 18.00 WIB, a resident in Banjarsari held a 1,000-day commemoration event attended by around 60 people. On Monday, June 30, 2025, a number of residents reportedly experienced complaints in the form of diarrhea, nausea, vomiting, and dizziness after consuming the food served at the event. Based on these incidents, epidemiological investigations are carried out to ascertain the status of the KLB, describe the magnitude of the incident, identify suspected foods as sources of exposure and risk factors, and formulate control measures and prevention recommendations so that similar incidents do not recur.

Method

This Extraordinary Event Investigation (KLB) of food poisoning uses a retrospective cohort study approach. This approach is used to find cases, confirm the occurrence of KLB, describe the characteristics of the event, and analyze the relationship between the consumption of each type of food and the appearance of symptoms of poisoning. The population at risk in this investigation is all residents who attended the 1,000-day commemoration event along with their family members who consumed food served at the location as well as blessing rice brought home from the Banjarsari Neighborhood. The inclusion criteria in this inquiry were people who attended events or received blessing rice and consumed at least one type of food provided. People who did not attend the event and did not receive the blessing rice from the activity were excluded from the investigation. The definition of a case in this KLB is any person in the at-risk population who experiences one or more symptoms in the form of diarrhea, nausea, vomiting, or dizziness after consuming food served or rice thanks to the 1,000-day commemoration event on Saturday, June 28, 2025. The determination of KLB status is carried out based on the results of epidemiological investigations by referring to the Ministry of Health of the Republic of Indonesia's 2023 Guidelines for Early Warning and Response Systems (SKDR) for Potential Diseases/Outbreaks, which states that the results of epidemiological investigations are used to determine an event as a KLB or not a KLB.

Data were collected using the standard epidemiological investigation questionnaire from the Ministry of Health of the Republic of Indonesia listed in the Guidebook for the Investigation and Management of Extraordinary Events of Infectious Diseases and Food Poisoning. Interviews were conducted retrospectively to obtain information about attendance at the event, the type of food consumed, the time of consumption, the time of symptom onset, and the complaints experienced. Data analysis was carried out descriptively to describe the characteristics of cases based on age group, gender, time of onset of symptoms, type of food consumed, and clinical picture. Retrospective cohort analysis was conducted by comparing attack rates in the group that consumed and did not consume each type of food. Furthermore, the risk ratio is calculated to determine the amount of risk of poisoning in the exposed group compared to the unexposed group. Foods with the highest attack rates and risk ratios are considered the most likely sources of exposure, while taking into account clinical suitability, incubation period, and laboratory test results.

The food samples that were successfully taken were three of the seven types of food served and examined at the Surabaya Health Laboratory Center (BBLK). Interviews were conducted with event participants who experienced symptoms, celebration owners, and food handlers to find out the chronology of the incident, processing procedures, storage, presentation, and the condition of the equipment used in food preparation. The information is used to support the tracing of the source of exposure and identify possible factors that contribute to the occurrence of food poisoning KLB.

Result and Discussion

1. Result

Food Processing Process

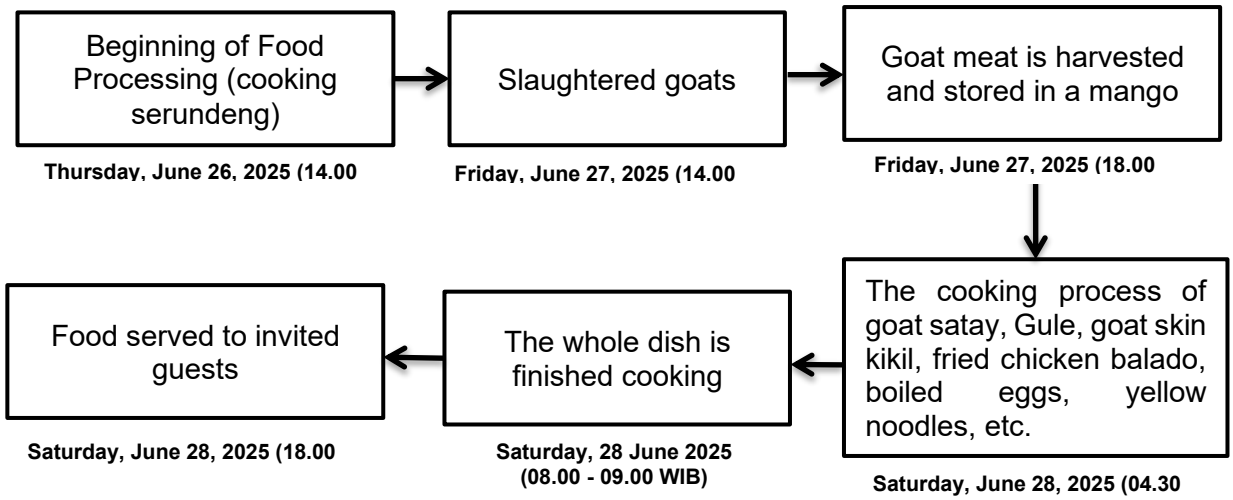

Figure 1. Food Processing Process Flow Diagram in the Incidence of Food Poisoning KLB

Based on the results of interviews with the celebration owners and food handlers, it is known that the food processing process for the 1000-day event will begin on Thursday, June 26, 2025. On that day, serundeng is cooked at around 14.00 WIB. On Friday, June 27, 2025, the goat was slaughtered at around 14.00 WIB and then uncovered half-cooked at 18.00 WIB. After the disclosure process, the goat meat is stored in a pan at room temperature without being put in the refrigerator or freezer. On Saturday, June 28, 2025, the food processing process will resume starting at 04.30 WIB. The activities carried out include recooking goat meat, boiling goat skin kikil, cooking yellow noodles, and processing fried chicken with red spices. The entire cooking process is completed at around 08.00–09.00 WIB. The menu served at the event consisted of goat satay, goat skin kikil, boiled eggs, red spiced fried chicken, yellow noodles, rice, and goat curry. The food is served directly to the invited guests at the event location, and packaged in the form of blessing rice to be distributed to guests who bring the food home.

Based on the results of tracing the processing process, it is known that some food ingredients undergo a storage process at room temperature for a relatively long time before being reprocessed and served. These conditions have the potential to increase the risk of the growth of pathogenic microorganisms that can cause food poisoning.

Respondent Characteristics and Clinical Symptoms

Based on the results of the field investigation, it was obtained that the number of invitations that had been distributed was approximately 60 people, and the types of food served and blessing rice, namely goat satay, goat skin kikil, boiled eggs, fried chicken with red spices, serundeng, yellow noodles, and goat curry. Based on the definition of the case determined, the number of people who were successfully interviewed was 49 people, of which 3 were not sick and 46 people were sick, so that the overall attack rate was 93.9% (46 out of 49 people). Based on Table 1, it is known that out of a total of 49 respondents interviewed, the largest age group is respondents aged 45–59 years, which is 14 people (28.6%). Furthermore, the age group of 15–24 years and 25–44 years each amounted to

12 people (24.5%). The age group ≥60 years old was 6 people (12.2%), while the age group 0–14 years was the group with the least number of respondents, which was 5 people (10.2%). Based on gender, most of the respondents were female, namely 28 people (57.1%), while male respondents were 21 people (42.9%). This shows that cases of food poisoning in this extraordinary event are more experienced by the adult age group and more in women.

Table 1
Distribution of Food Poisoning Respondent Characteristics in 2025

No	Variable	Frequency (N=49)	Percentage (%)
	Age		
1	0 - 14 Years	5	10.2
2	15 - 24 Years	12	24.5
3	25 - 44 Years	12	24.5
4	45 - 59 Years	14	28.6
5	≥ 60 Years	6	12.2
	Gender		
1	Male	21	42.9
2	Women	28	57.1

Source: Primary Data, 2025

Based on Figure 2, it is known that the most common clinical symptom experienced by respondents in the extraordinary incidence of food poisoning in Kanigoro District in 2025 is diarrhea, which is 46 people (76.7%). Furthermore, vomiting symptoms were experienced by 8 people (13.3%), followed by nausea as many as 4 people (6.7%), and dizziness as many as 2 people (3.3%). The prevalence of diarrhea symptoms showed that most of the respondents experienced disorders in the digestive tract due to the consumption of contaminated food. This indicates the possibility of microbiological contamination in the food consumed at the time of the incident.

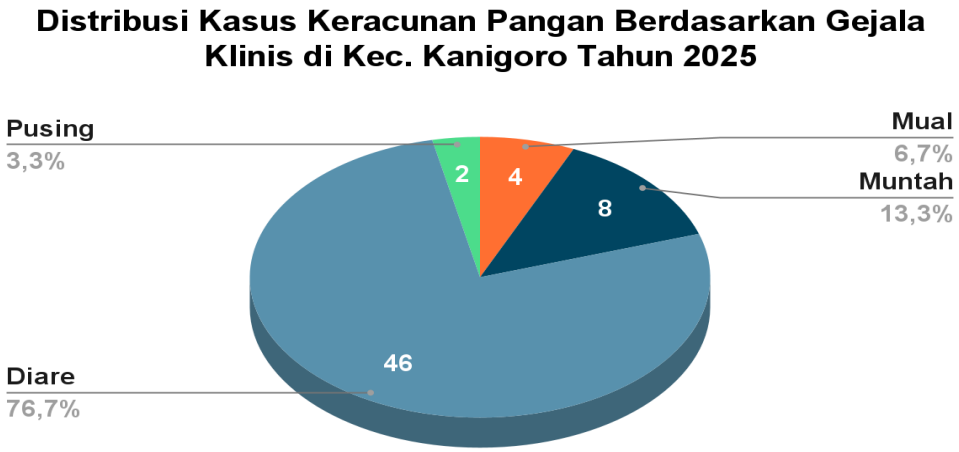

Figure 2. Distribution of cases according to clinical symptoms of food poisoning

Incubation Period and Onset of Food Poisoning Symptoms

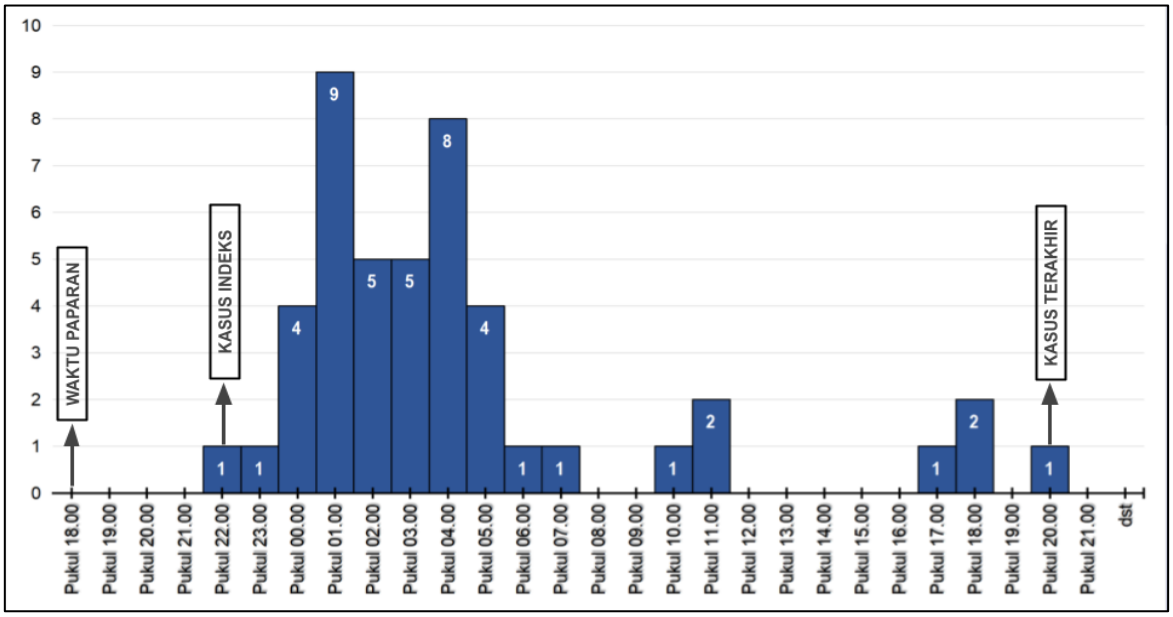

Figure 3. Epidemic Curve Based on Time of Symptom Onset of KLB Cases Food Poisoning in Banjarsari Environment, Blitar Regency, June 2025

Based on the epidemic curve, it is known that the shortest incubation period is 4 hours and the longest incubation period is 29 hours after consuming the dishes served at the 1000 daily event on June 28, 2025. The first case (index case) began to experience symptoms at 22.00 WIB on June 28, 2025 or about 4 hours after exposure to food. The peak of the incident occurred at 01.00 WIB on June 29, 2025 with the highest number of cases as many as 9 people, while the last case began to experience symptoms at 20.00 WIB on June 29, 2025 or about 29 hours after exposure.

The epidemic curve pattern shows a rapid increase in the number of cases in a short period of time followed by a gradual decrease in the number of cases. This pattern indicates that this event is a common *source outbreak type*, which is an event that comes from the same source of exposure at the same time at the same time. The time interval between food exposure and the appearance of the first symptoms indicates an incubation period that is in accordance with the characteristics of *foodborne diseases*. The difference in the time of symptom onset between individuals may be influenced by the amount of food consumed, the dose of causative agents entering the body, and the difference in the immune system of each individual.

Based on Table 2, it is known that the highest *attack rate* value in the group that consumed food was found in the menu of boiled eggs, fried chicken balado, and yellow noodles, each of 1.00 (100%). This shows that all respondents who consumed the food experienced symptoms of poisoning. Meanwhile, in the group that did not consume food, the highest *attack rate* value was found in the goat skin kikil menu of 1.00 (100%), while the lowest *attack rate* value was found in the serundeng and rice menus which did not show any cases in the group that consumed it.

Table 2
Attack Rate and Attack Rate Ratio of Food Poisoning by Type of Processed Food

No	Types of Food	People Who Eat			People who don't eat			Ratio AR
		Pain	Doesn't Hurt	*Attack Rate (%)*	Pain	Doesn't Hurt	*Attack Rate (%)*	
1	Goat Satay	34	2	94.4	12	1	92.3	1.02
2	Goat Skin Grinder (Lento)	20	3	86.9	26	0	100	0.87
3	Hard-boiled eggs	3	0	100	43	3	93.4	1.07
4	Balado Fried Chicken	7	0	100	39	3	92.8	1.08
5	Serundeng	0	0	0	46	3	93.8	Uncountable
6	Yellow Noodles	2	0	100	44	3	93.6	1.06
7	Rice	0	0	0	46	3	93.8	Uncountable
8	Goat Gule	6	1	85.7	40	2	95.2	0.9

Source: Primary Data, 2025

The results of the risk analysis in table 2 show that *the highest Attack Rate* (RAR) value is found in the balado fried chicken menu of 1.08, followed by boiled eggs of 1.07 and yellow noodles of 1.06. This shows that respondents who consume these foods have a higher risk of experiencing food poisoning compared to respondents who do not consume them. In contrast, some types of foods such as goat skin kikil and gule have a *Ratio Attack Rate <1, which* indicates that these foods are not significantly related to the incidence of food poisoning in these events. In addition, on the serundeng and rice menus, the Risk Ratio value could not be calculated because no cases were found in the group that consumed these foods. This condition shows that the two types of food do not contribute to the occurrence of food poisoning.

Table 3
Food Sample Laboratory Examination Results

Types of Inspections	Examination Results		
	Gule Cuisine	Kikil Cuisine	Goat Satay
Salmonella sp.	Negatives	Negatives	Negatives
E. Coli O-157	Negatives	Negatives	Negatives
Staphylococcus	Negatives	Negatives	Negatives
Bacillus cereus	Negatives	Negatives	Negatives
Vibrio cholerae	Negatives	Negatives	Negatives
Clostridium perfringens	Negatives	Negatives	Negatives

Source : BBLK Surabaya, 2025

Based on the results of microbiological examination of three samples of food residues in the form of goat curry, goat skin kikil, and goat satay, no pathogenic bacteria such as Bacillus cereus, Clostridium perfringens, Salmonella sp., Staphylococcus aureus, Escherichia coli O-157, or Vibrio cholerae were found. However, negative laboratory test results do not necessarily rule out the possibility of food poisoning KLB. This is because not all types of food consumed can be examined, sampling is carried out two days after the incident, namely June 30, 2025, and there is a possibility of other causative agents or toxins that are not included in the laboratory examination parameters.

Environmental Observation Results

Figure 4. Observation and Sampling of Food and Water at the Event Organizer's House

Based on the results of environmental observations at the event organizer's house, it is known that food processing activities are carried out in the kitchen of the house with environmental conditions that have the potential to increase the risk of contamination. The kitchen area is about ±1 meter away from the chicken coop, allowing microorganisms from the surrounding environment to enter the food processing area, either through air, insects, or the equipment used. The kitchen conditions are semi-open with limited ventilation and food processing equipment is used together for several types of cooking without a clear separation between raw materials and cooked ingredients. In addition, the washing area of equipment and foodstuffs is in the same room as the processing area, thus increasing the potential for cross-contamination.

Overall, the results of epidemiological investigations show that this incident was designated as a food poisoning outbreak. This is supported by the existence of a group of cases with similar symptoms after consuming food at the same event, the epidemic curve pattern that indicates *a common source outbreak*, the results of *attack rate analysis* that identify several menus with a higher risk, and the discovery of factors that have the potential to cause food contamination during the process of processing, storing, and serving food based on the results of environmental observations. Although laboratory examination of food samples showed negative results, the findings did not rule out the possibility of food poisoning KLB because not all types of food consumed could be examined, sampling was carried out two days after the incident, and there was a possibility of causative agents or toxins that were not included in the laboratory test parameters. Therefore, the determination of the occurrence as a food poisoning outbreak

is based on the overall results of epidemiological investigations which include the epidemiological relationship between cases, the distribution of cases according to people, places, and times, the results of attack rate analysis, and the results of environmental observations, and not solely based on the results of laboratory examinations.

2. Discussion

Based on the results of epidemiological investigations, the incidence of food poisoning in Banjarsari Village, Kanigoro District in 2025 shows a common source outbreak pattern, namely exposure from the same source at a relatively simultaneous time. This can be seen from the epidemic curve which shows a rapid increase in cases with one major peak, as well as the shortest incubation period of 4 hours and the longest 29 hours after food consumption. The very high overall attack rate of 93.9% (46 out of 49 interviewees) indicated almost equal exposure among all respondents, consistent with the common source outbreak pattern of a single food source. This pattern is consistent with the characteristics of the incidence of food poisoning due to a single exposure at a time.

Based on the results of epidemiological investigations, the incidence of food poisoning in the Banjarsari Environment, Kanigoro District, Blitar Regency in 2025 is designated as an Extraordinary Event (KLB) of food poisoning. The determination is not based solely on the results of laboratory examinations, but based on the overall results of epidemiological investigations in accordance with the Ministry of Health of the 2023 Early Warning and Response System (SKDR) Guidebook. The results of the investigation showed that there was a group of cases with similar clinical symptoms after consuming food at the same event, the epidemiological relationship between cases, the pattern of the epidemic curve leading to a common source outbreak, the results of attack rate analysis, and the discovery of contamination risk factors during the process of processing and storing food based on environmental observation results.

The epidemic curve shows a common source outbreak pattern, where all cases come from the same source of exposure at the same time at the same time. This is marked by a rapid increase in the number of cases which forms one main peak, followed by a gradual decrease in the number of cases. The incubation period ranges from 4 to 29 hours after food consumption. The pattern corresponds to the characteristics of the incidence of food poisoning due to a single exposure at a time and suggests that all cases are likely to have originated from the same food source. The incubation period range of 4–29 hours leads to the possible etiology of enteric bacteria as well as toxin-producing bacteria. Some of the causative agents that have an incubation period according to this range include Staphylococcus aureus, Bacillus cereus, and Clostridium perfringens. All three bacteria are generally related to food that is cooked in large quantities, stored at room temperature for a long time, then reheated before serving. This condition is in accordance with the results of a field investigation which shows that the food processing process has started since two days before the event and some of the food ingredients are stored at room temperature before being cooked again.

The results of laboratory examination of three samples of food residues in the form of goat gule, goat skin kikil, and goat satay showed negative results for Salmonella sp., Escherichia coli O157, Staphylococcus aureus, Bacillus cereus, Vibrio cholerae, and Clostridium perfringens. However, these negative results cannot be interpreted as the absence of food poisoning or as a basis for getting rid of the KLB determination. Based on the Guidelines for the Investigation and Management of Extraordinary Events (KLB) of Infectious Diseases and Food Poisoning of the Ministry of Health of the Republic of

Indonesia, the type of specimen examined must be adjusted to the suspected causative agent. In some bacteria that cause food poisoning, such as Escherichia coli and Staphylococcus aureus, clinical specimens in the form of feces, vomit, and rectal wipes have a higher diagnostic value than food residues. In this investigation, laboratory examinations were only carried out on food scraps, while clinical specimens from patients were not successfully obtained. In addition, only three of the seven types of food consumed by respondents were successfully examined, so the possibility of contamination coming from other foods that were not tested is still open. Sampling was also carried out two days after the incident when the food had undergone storage and reheating, so the number of live bacteria may have decreased to below the limit of laboratory detection, while previously formed toxins could still cause clinical symptoms in consumers.

Thus, negative laboratory test results do not necessarily negate the possibility of food poisoning KLB. The determination of the KLB in this incident is based on the overall results of the epidemiological investigation which includes the epidemiological relationship between cases, the distribution of cases by person, place, and time, the pattern of the epidemic curve, the results of attack rate analysis, and the results of environmental observations, so that laboratory results are one of the supporting components in the investigation process, not the only basis for determining the KLB. In addition to laboratory results, epidemiological analysis based on food consumption patterns also provides an overview of the source of exposure. Attack rate analysis shows that some types of foods have high attack rate values in the group that consumes them. However, the value of the Attack Rate Ratio in all types of food is relatively close to one. This suggests that the difference in attack rates between the groups that eat and does not consume certain foods is so striking that there is no single type of food that can epidemiologically be determined as the sole source of events. These conditions indicate that exposure may occur widely due to cross-contamination during the food processing process, the use of the same equipment for several types of food, and the same food handlers handling the entire dish without adequate sanitary *hygiene* practices.

Although some types of food recorded a 100% attack rate in the group that consumed them, the Attack Rate value of the entire menu was relatively close to one, suggesting that no single type of food could be epidemiologically established as a single source of the event. This pattern is more consistent with the hypothesis of cross-contamination that occurs widely during the processing process, compared to the hypothesis of a single type of food as the source of exposure. The results of environmental observations strengthen this suspicion. The food processing process is carried out in a semi-open home kitchen, has limited ventilation, and is about one meter away from the chicken coop, increasing the potential for contamination from the surrounding environment. In addition, the processing equipment is used together without a clear separation between raw materials and cooked food, while the washing area of the equipment and foodstuffs is in the same room as the processing area. The food storage process also does not meet the principles of food safety because the goat meat that has been exposed is stored at room temperature for several hours before being cooked again. These conditions have the potential to support the growth of microorganisms and increase the risk of cross-contamination during the food processing process.

These findings are in line with research by Sari et al. (2019) and Prasetyo et al. (2021) which showed that food storage at room temperature for more than four hours and food processing in a less hygienic environment are the main factors in the occurrence of food poisoning in community activities. Storing food at room temperature for long periods of time allows bacteria to multiply to infective amounts or produce toxins that remain pathogenic even after the food has been reheated before serving. These conditions are in accordance with the results of observations in this investigation, where food is prepared in large quantities, stored at room temperature, and undergoes a reheating process before being served to invited guests. The limitations of this investigation include the unavailability of all types of food as laboratory samples, the absence of clinical specimens from the patient, and the time of sampling carried out two days after the incident so that it can affect the results of microbiological examinations. In addition, not all respondents can be interviewed directly so the possibility of information bias can still occur. These limitations need to be considered in interpreting the results of laboratory tests.

However, the overall results of the epidemiological investigation show that this incident meets the characteristics of food poisoning KLB. This conclusion is supported by the epidemiological relationship between cases, similarities in food exposure, epidemic curve patterns that indicate common source outbreaks, attack rate analysis results, and the discovery of various contamination risk factors based on environmental observation results. Therefore, this incident is most likely caused by a combination of food processing factors that do not meet the principles of sanitary hygiene, inappropriate food storage, and environmental conditions that have the potential to cause food contamination, even though laboratory examination results of food samples show negative results.

Conclusion

Based on the results of an epidemiological investigation, the incident in the Banjarsari Neighborhood, Kanigoro District, Blitar Regency in 2025 is designated as an Extraordinary Event (KLB) of food poisoning. The determination is based on the epidemiological relationship between cases, the pattern of the epidemic curve that shows a common source outbreak, the results of attack rate analysis, and the findings of environmental observations, so that it does not solely depend on the results of laboratory examinations. The results of laboratory tests on three food samples showed negative results for the pathogenic bacteria examined. However, these results did not rule out the possibility of food poisoning due to the limitations of the type and number of samples examined, the unavailability of clinical specimens, and the timing of sampling conducted after the incident. Based on the overall results of the investigation, this incident is most likely caused by a combination of inadequate sanitary hygiene practices, storage of food at room temperature for a long time, and environmental conditions of food processing that have the potential to cause cross-contamination.

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