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Faktor yang Berhubungan dengan Keberadaan Cemaran Timbal pada Gorengan Ote-Ote di Kota Surabaya Tahun 2022

Factors Associated with Lead (Pb) Contamination in Ote-Ote Fritters in Surabaya City in 2022

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ABSTRAK

Latar Belakang: *Timbal (Pb) adalah salah satu jenis cemaran kimia yang masih kerap ditemukan keberadaannya pada gorengan yang dijajakan di pinggir jalan. Salah satu jenis gorengan yang sering ditemui di wilayah Surabaya adalah ote-ote.*
Tujuan: *Tujuan pada penelitian ini adalah mengetahui faktor yang berhubungan dengan keberadaan cemaran timbal (Pb) pada gorengan ote-ote di Kota Surabaya.*
Metode: *Penelitian ini menggunakan metode observational analitik dengan pendekatan cross-sectional. Jumlah sampel yaitu 38 responden pedagang gorengan memenuhi kriteria inklusi dan eksklusi yang dipilih dengan menggunakan teknik random sampling. Sampel ote-ote dilakukan uji analisis kadar timbal (Pb) dengan menggunakan timbal (Pb) Easy Kit dan menggunakan uji statistik chi-square.*
Hasil: *Hasil penelitian menunjukkan bahwa sebagian besar gorengan ote-ote di Kota Surabaya mengandung timbal dengan faktor yang berhubungan yaitu pendapatan bulanan dan kebersihan peralatan. Selain itu, timbal (Pb) dapat ditemukan pada pedagang yang berjualan dengan menggunakan gerobak, pendidikan terakhir SMA, dan tingkat pengetahuan yang rendah.*
Kesimpulan: *Faktor yang berhubungan dengan keberadaan cemaran timbal pada gorengan ote-ote adalah pendapatan bulanan dan kebersihan peralatan. Kerjasama antar pihak diperlukan, seperti BPOM, Dinas Kesehatan, dan kesadaran pedagang untuk mengurangi cemaran timbal pada produk gorengan ote-ote.*

Kata kunci: *Pendapatan, Kebersihan, Timbal, Ote-ote*

ABSTRACT

Background: Lead (Pb) is a chemical contamination commonly found in fritters street food snacks. Ote-ote is one of them.
Objectives: This study researched factors associated with Lead (Pb) contamination in ote-ote fritters in Surabaya.
Methods: This research was an analytical observational using a cross sectional method. The number of samples was 38 traders who fulfilled the inclusion and exclusion criteria that chosen with random sampling technique. Samples were qualitatively analyzed with Lead (Pb) Easy Kit and chi-square statistic test.
Results: The result showed that most of ote-ote in Surabaya contained Lead (Pb) with factors associated were monthly income and sanitary facilities. In addition, Lead (Pb) was commonly found in food carts, high school education, and low level of knowledge.
Conclusions: Factors associated with Lead contamination in Ote-Ote fritters were trader's monthly income and facilites sanitary. Stakeholder collaboration, such as BPOM, Dinas Kesehatan, and trader's awareness are needed to prevent Lead contamination in ote-ote.

Keywords: Income, Sanitary, Lead, Ote-ote

INTRODUCTION

Food safety is one of the issues that still need special attention from multisectoral and multidiscipline. One of the food safety issues that highlighted is foodborne illness. Five Indonesia's province that has the highest foodborne illness were West Java, East Java, DKI Jakarta, Bali, and Banten (BPOM, 2019). Frequent causative factors associated with foodborne illness were food processing related to a pathogen (Arisanti, Indriani and Wilopo, 2018). Hence, food security assurance was needed to make sure food was free from contamination either pathogen or else (BPOM, 2020).

Chemical contamination is one of the contaminants that are commonly found in processed street food snacks. Street food snacks are food that is sold by strret vendors in a public crowd. One of the street food snacks favorites is fritters. Following BPSs, the average of Indonesian fritters consumption in March 2021 was 2.902 pieces with consumption participation about 77,1% (Statistik, 2021). Fritters in Indonesia commonly sold on the roadside in open air which can lead to a higher risk of Lead (Pb) contamination (Yulia, Syahrianti and Yulis, 2021).

Lead (Pb) is a poisonous heavy metal but can be consumed in a processed food with a maximum level of contamination by 0.25 mg/kg (BPOM, 2009). There are many factors that can cause Lead (Pb) in fritters, such as oil usage frequency, types of wrapper, or even the sellers' sanitation (Sagita, Dewanti and Sulistiyani, 2020). High levels of lead is also caused by the duration of polluted air exposure (Novianty and Mawati, 2020).

Besides, sellers' level of knowledge can affect the Lead (Pb) content (Restiani, Sutiningsih and Hestiningsih, 2020). Hence, the author is willing to research factors associated with Lead (Pb) in fritters. Aside, research about Lead (Pb) contamination in fritters in East Java especially Surabaya is limited.

METHOD

This research was analytical observational research using cross-sectional method. The population was registered food merchants who sell fritters, especially ote-ote in online application in Surabaya city. Number of populations was 62 that registered as online food merchants. The Lead (Pb) levels were analyzed with a qualitative method using Lead (Pb) Easy Kit. This research has been ethically approved through the Health Research Ethics Committee of the Faculty of Public Health of Airlangga University by 26/EA/KEPK/2021. Variables measured were monthly income, food trader's location, facilities sanitary, education levels, and levels of knowledge. Data were analyzed using chi-square test (CI=95%). The sampling method used in this research was a simple random technique with some inclusion and exclusion applied. Inclusive criteria ware traders who sell their *ote*-ote fritters in online platforms (*grabfood, gofood,* and *shoppeefood*). Exclusive criteria were traders who had branches or same shop. The number of ote-ote samples meets the criteria were 38 respondents. All samples were collected by buying through the seller to prevent Lead (Pb) contaminations from wrappers. All food samples were put in a sterilized food container using 70% alcohol. Labels number were written down on the food container to help differentiate it.

RESULT AND DISCUSSION

Based on table 1, displays that traders mostly were females (78.9%) with the age of 26 – 44 years old (63.2%) categorized as adult. Based on table 2, shows that the majority of ote-ote samples (52.6%) contained Lead (Pb).

Tabel 1. Subjects Characteristics

Characteristics	n	(%)
Gender		
Male	8	21.1
Female	30	78.9
Age		
18 – 25 y.o.	4	10.5
26 – 44 y.o.	24	63.2
45 - 59 y.o.	8	21.1
> 60 y.o.	2	5.3

Table 2. Qualitative Analysis of Lead (Pb) Contents in Ote-Ote

Variable	n	(%)
Lead		
Positive (+)	20	52.6
Negative (-)	18	47.4

The Regional Minimum Wage of Surabaya City in 2022 was 4.3 thousand IDR. The analysis test results show that in every income stage there are fritters contained Lead (Pb) with a p-value of 0.040. So, it can conclude that monthly income has association with Lead (Pb) in ote-ote. In field, even the highest monthly income had all their samples contained Lead (Pb). Sellers with high incomes tend to have a higher financial literacy to plan and control theirs (Arisanti, Indriani and Wilopo, 2018). People with high financial litercary also tend to invest more in others (Safryani, Aziz and Triwahyuningtyas, 2020).

Due to various samples location used in the research, some locations were at high risk of contamination because some of it weren't all covered and easily polluted. Food services hygiene

and sanitation regulation can be found in the Regulation of Health Minister if the Republic of Indonesia number 1096/MENKES/PER/VI/2011 (Kemenkes RI, 2011). It mentions that foods must be pollutions and contaminations free. The regulation defines that food services must predefine all the agreements, such as food selection, storage, proccesing, clean water, kitchen equipment, distribution, and else. Hence, if the food merchants haven't met all all the agreements, the products may contaminate. Research about Lead (Pb) levels analysis that are using using a cover and aren't using a cover verifies that banana fritters use a food cover has lower Lead (Pb) content than the other which didn't have a cover (Ardalina, Hasan and Chahaya, 2013). This research also confirms that seller facilities' sanitary has significant relation to Lead (Pb) (p=0.045) with 100% of dirty vendors contaminated. Based on observations in field, author found that there were identifical findings in trader's that categorized have bad facilities sanitary or called dirty. Most of them didn't used standarized utensils, such as corroded and stratches. Utensils that didn't met the standarized categories are easy to contaminate the foods (Qatrunnada, 2019).

Table 3. Monthly Income Associations with Lead (Pb) Contents

Variable	Lead (Pb)				*p value*
	Negative (-)		Positive (+)		
	n	(%)	n	(%)	
Monthly Income					
< Regional Minimum Wage	17	58.6	12	41.4	**0.040***
Regional Wage – 2x Regional Minimum Wage	4	16.7	5	55.6	
> 2x Regional Minimum Wage	0	0.0	3	100.0	

Table 4. Table Trader's Location Associations with Lead (Pb) Contents Taken from Primary Data

Variable	Lead (Pb)				*p value*
	Negative (-)		Positive (+)		
	n	(%)	n	(%)	
Locations					
Cart	10	52.6	9	47.4	0.209
Home	2	22.2	7	77.8	
Stall	6	60.0	4	40.0	

Table 5. Table Trader's Facilites Sanitary Assocations with Lead (Pb) Contents from Taken Primary Data

Variable	Lead (Pb)				*p value*
	Negative (-)		Positive (+)		
	n	(%)	n	(%)	
Traders Sanitary*					
Dirty	0	0.0	4	100.0	**0.045***
Clean	18	52.9	16	47.1	

Table 6. Table Education Level Associations with Lead (Pb) Contents Taken from Primary Data

Variable	Lead (Pb)				*p value*
	Negative (-)		Positive (+)		
	n	(%)	n	(%)	
Education Level					
No school	0	0.0	1	100.0	
Elementary	1	25.0	3	75.0	
Junior	3	33.3	6	66.7	0.455
Senior	9	56.2	7	43.8	
Bachelor	5	62.5	3	35.7	

Table 7. Table Trader's Level of Knowledge Associations with Lead (Pb) Content Taken from Primary Data

Variable	Lead (Pb)				*p value*
	Negative (-)		Positive (+)		
	n	(%)	n	(%)	
Levels of Knowledge					
Low (≤ 55%)	17	48.6	18	51.4	0.612
Average (56 – 74%)	1	33.3	2	66.7	

Education level and Lead (Pb) content in this research weren't showing significant associations. This correlate with research about analysis of public perception to Lead (Pb) contamination water spinach confirms that there weren't significant relations between education level and Lead (Pb) perceptions (Putri, Rosyada and Arinda, 2019). Education level didn't always have a correlation with person's knowledge (Negara and Prabowo, 2018). It strengthens by the author findings that majority of the respondents didn't knew what Lead (Pb) is and the health risks that can Lead (Pb) caused.

Based on Table 7 concludes that knowledge was not having significant correlations with Lead (Pb) in ote-ote (p=0.612). Research about the perception of Lead (Pb) showed that knowledge also didn't have significant associations due to Lead (Pb) perception in people ((Putri, Rosyada and Arinda, 2019). Differences in knowledge didn't guarantee traders' food safety (Nofalina, 2013). Based on author observations in field, it was found out that traders made their product based on their cooking habits and intuitions, not following the existed and established procedures.

CONCLUSION

Majority of ote-ote fritters that sold in Surabaya city contained Lead (Pb). Factors associated with Lead (Pb) contaminations in fritters are trader's monthly income and facilities sanitary. Besides, trader's selling location, education level, and level of knowledge didn't have significant associations due to the contamination. Author suggests that collaboration in every stage of stakeholders were needed to lower the contamination. Information about Lead (Pb) are also needed to be given in addition to lift up trader's awareness about the health risks outcome.

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