## **KORESPONDENSI PAPER**

JUDUL : Prohibited Coloring Agent in Dominating Hazardous Street Food around Elementary School in Semarang-Indonesia

# JURNAL : International Journal of Food Engineering

**STATUS : Scopus -**

No	Aktivitas	Tanggal	Keterangan	Hal
1	Submission Artikel	17 Januari 2018	Email: C3004	2-4
2	Review Artikel	27 Februari 2018	<ul> <li>Email: ICFEB 2018</li> <li>Notification-C3004</li> <li>Comments from reviewer</li> <li>Hasil review oleh reviewer</li> </ul>	5-10
3	Revisi Artikel	27 Februari 2018	Email: Paper Revision_ICFEB 2018	11-18
3	Complete submission	28 Februari 2022	Email: Complete submission for ICFEB 2018	19-21
4	Final conformation	11 Mei 2018	Email: C3004-FINAL CONFIRMATION	22-24
5	Published confirmation	14 Desember 2018 dan 7 November 2018	Email: Paper published	25-27
5	Published	1 Maret 2019	Volume 5 No 1	28



# C3004

4 messages

icfeb@cbees.org <icfeb@cbees.org> To: Gemala Anjani <gemaanjani@gmail.com> Wed, Jan 17, 2018 at 3:24 PM

Dear Gemala Anjani,

Thanks for your full paper submission to ICFEB 2018. Your paper titled "Prohibited coloring agent in

dominating hazardous street food around Elementary School in Semarang-Indonesia" is given ID: C3004. Please keep it in mind.

And I will apply for a discount price for you if you will register an abstract and a full paper with one participant. But I am not sure it will succeed. Hope you have a good day. Best regards,

Ms. Zero Jiang

**Conference Specialist** 

ICFEB 2018-http://www.icfeb.org

Conference e-mail: icfeb@cbees.org

Tel: +86-28-86528465 (China Branch)

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HKCBEES Headquarter Address: Unit B, 6/F, Dragon Industrial Building, 93 King Lam Street, Lai Chi Kok, Kowloon, Hong Kong

From: Gemala Anjani Date: 2018-01-17 16:07 To: icfeb@cbees.org Subject: Re: Re: C3002

Dear Committee,

Here I send you my full paper to be submitted to the International Journal of Food Engineering. Therefore I submit :

1. Abstract only for presentation

2. This paper, to be submitted to the International Journal of Food Engineering.

Both are my name as the first author. Could you please give me the good price for both of them

Thank you

Best Regards,

Gemala Anjani

On Tue, Jan 16, 2018 at 5:08 PM, icfeb@cbees.org <icfeb@cbees.org> wrote: Dear Gemala Anjani, You can send me your full paper directly. And please send it to me as soon as possible. About the registration fee, 350USD for presentation only, 450USD for full paper. If you will register an abstract and a

#### Gmail - C3004

full paper, and there are one participants, I can apply for you a discount price. If there are two participants, maybe there are no discount price. Best regards,

Ms. Zero Jiang

**Conference Specialist** 

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HKCBEES Headquarter Address: Unit B, 6/F, Dragon Industrial Building, 93 King Lam Street,

Lai Chi Kok, Kowloon, Hong Kong

From: Gemala Anjani Date: 2018-01-16 15:58 To: icfeb@cbees.org Subject: Re: C3002

Dear Committe,

I send you our author background as I attach in this email. I will send you another paper to be reviewed in the format of International Journal of Food Engineering. Therefore I need more information how to submit the full-paper. And How much should I pay for that?

Thank you

Best Regards

Gemala

On Mon, Jan 15, 2018 at 11:24 AM, icfeb@cbees.org <icfeb@cbees.org> wrote:

Dear Gemala,

Thanks for your abstract submission to ICFEB 2018. Your abstract titled

"Encapsulated Vitamin D3 in Liposome Coating by  $\beta$ -Lactoglobulin" is given ID: C3002. Please keep it in mind.

And please fill in author's background form and send back to me as soon as possible. Best regards,

Ms. Zero Jiang

**Conference Specialist** 

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Gmail - C3004 HKCBEES Headquarter Address: Unit B, 6/F, Dragon Industrial Building, 93 King Lam Street, Lai Chi Kok, Kowloon, Hong Kong From: Gemala Anjani Date: 2018-01-15 06:48 To: icfeb Subject: Abstract Submission Dear Committee, My name is Gemala Anjani from Diponegoro University-Indonesia. I would like to submit my abstract for oral presentation in ICFEB 2018 as I attach in this email I read in the website that the submission is extended to 20th of january 2018. I wish it is not to late to send you my abstract today. Thank you very much Best Regards, Gemala Anjani

**Gemala Anjani** <gemaanjani@gmail.com> To: "icfeb@cbees.org" <icfeb@cbees.org>

Dear Committee,

Thank you for your quick response. So, what is the next step?

When should I register in the website? or it is automatically registered? Thank you

Best regards

Gemala Anjani

[Quoted text hidden]

## icfeb@cbees.org <icfeb@cbees.org> To: gemaanjani@gmail.com

Dear Colleague, Thank you for your email. The Organising Group will respond to your enquiry in three work days. If you have any questions regarding the conference please visit the website which will be updated with information on the conference as it becomes available.

Kindest Regards,

Organising Group ICFEB 2018

icfeb@cbees.org <icfeb@cbees.org> To: Gemala Anjani <gemaanjani@gmail.com>

Dear Gemala Anjani,

Thanks for your reply. I will send your full paper to the committee. It will take a few days to receive the result and review form from the committee. If your paper was accepted, I will send you acceptance letter. And then you can register follow the steps on the acceptance letter. [Quoted text hidden]

Wed, Jan 17, 2018 at 3:34 PM

Wed, Jan 17, 2018 at 3:34 PM

Wed, Jan 17, 2018 at 3:43 PM



Gemala Anjani <gemaanjani@gmail.com>

# ICFEB 2018 Notification-C3004

3 messages

Fri, Feb 9, 2018 at 10:08 AM

icfeb@cbees.org <icfeb@cbees.org> To: Gemala Anjani <gemaanjani@gmail.com>

Dear Gemala Anjani,

First of all, thank you for your concern. 2018 9th International Conference on Food Engineering and Biotechnology (ICFEB 2018) review procedure has been finished. We are delighted to inform you that your manuscript has been accepted for presentation at 2018 9th International Conference on Food Engineering and Biotechnology (ICFEB 2018), Okinawa, Japan. Best Regards

Ms. Zero Jiang

Conference Specialist

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## 2 attachments

CFEB 2018 Notification-C3004.pdf

Review form-C3004.pdf 311K

**Gemala Anjani** <gemaanjani@gmail.com> To: trisna suryaningrum <trisnasuryaningrum@gmail.com> Mon, Feb 12, 2018 at 10:19 AM

[Quoted text hidden]

2 attachments

ICFEB 2018 Notification-C3004.pdf 304K

Review form-C3004.pdf 311K

**Gemala Anjani** <gemaanjani@gmail.com> To: trisna suryaningrum <trisnasuryaningrum@gmail.com> Tue, Feb 27, 2018 at 10:04 AM

Dear Committee,

I would like to submit my revision full paper in ICFEB 2018 as I attach in this email. I wish it is not to late to send you today. Thankyou very much.

Best Regards, Gemala Anjani [Quoted text hidden]

## 2 attachments

Jurnal IJFE-revision.doc 17424K

Jurnal IJFE-revision.pdf 143K



# **Review Form of ICFEB 2018**

http://www.icfeb.org/

Paper ID : C3004

Paper Title : Prohibited coloring agent in dominating hazardous street food around Elementary School in Semarang-Indonesia

The Evaluation of the paper					
		□Match to the conference topic <b>ver</b>	y well;		
	The Topic's Conformity	$\blacktriangle$ Match to the conference topic <b>f</b> ai	irly;		
Торіс		$\Box$ Match to the conference topic <b>po</b>	orly;		
•		Sufficiently comprehensive and balanced			
	The Coverage of the Topic	Important Information is missing or superficially treated			
		Certain parts significantly overstre	essed		
	Innovation	□Highly Innovate ▲ Suffic	iently Innovate		
		□Slightly Innovate □Not No	vel		
	Integrality	□Poor □Fair ▲Good			
	The "literary"	□Totally Accessible ▲ Mostly	Accessible		
Contents	presentation	□Partially Accessible □Inacces	sible		
		Appropriate for the generally knowledgeshie individual			
	The technical depth	▲ Appropriate for the generally kn	iowledgeable individual		
		working in the field			
Description		□Suitable only for an expert			
Presentation	□Satisfactory	▲ Needs improvement	□Poor		
organization	□Satisfactory	▲ Could be improved	□Poor		
organization					
Recon	mendation for Pub	olication& Detailed Su	iggestions		
	▲ Strongly Accept;	□Accept;	□ weakly Accept		
	Comments (Please prepare	the final version of the paper as per re	eview instructions):		
	1. Table 2 did not be mentioned i	n the context, you should mention it;			
	2. In the abstract, " <b>Snack foods</b>	In the abstract, "Snack foods comprise ready-to-eat foods and beverages that are bought and			
	sold by traders on the street	and are regularly consumed by most	of the schoolchildren." It		
(please chose	makes me confused. Maybe y	you want to express ""Snack foods com	prise ready-to-eat foods		
one)	and beverages that are sold b	oy traders"			
	3. In the method, "These sample	es included the type of foods sold aroun	nd the schools." It's better		
	to use "These samples includ	ed the foods sold around the schools."			
	4. The paper structure is good;				
	5. This paper has a very interesting	ng research points.			



	□ Strongly Reject	□ Reject	weakly Reject
□Rejected	□Paper is not of sufficient quality	or novelty to be published in t	he Journal).
(please chose	$\Box$ A major rewrite is required, enco	urage resubmission.	
one)	$\Box$ The topic of the paper does not	matches to the conference to	ppic, encourage to submit to another
	conference: http://www.cbees.org/e	vents/)	



# **Notification of Acceptance of the ICFEB 2018**

Okinawa, Japan, March 28-30, 2018

http://www.icfeb.org/



- Paper ID : C3004
- Paper Title : Prohibited coloring agent in dominating hazardous street food around Elementary School in Semarang-Indonesia

Dear Gemala Anjani,

First of all, thank you for your concern. 2018 9th International Conference on Food Engineering and Biotechnology (ICFEB 2018) review procedure has been finished. We are delighted to inform you that your manuscript has been accepted for presentation at 2018 9th International Conference on Food Engineering and Biotechnology (ICFEB 2018), Okinawa, Japan. Your paper was tripling blind-reviewed and, based on the evaluations. The reviewers' comments are enclosed.

The conference received papers from about 12 different countries and regions during the submission period. And there are about 30 papers accepted by our reviewers who are the international experts from all over the world. The selected papers could be published in the international conference proceeding with high quality. According to the recommendations from reviewers and technical program committees, we are glad to infrom you that your paper identified above have been selected for publication and oral presentation. You are invited to present your paper and studies during our ICFEB conference that would be held on March 28-30, 2018.

The ICFEB 2018 is co-sponsored by Hong Kong Chemical, Biological & Environmental Engineering Society (HKCBEES).

International Journal of Food Engineering (IJFE, ISSN: 2301-3664), and be included in the Engineering & Technology Digital Library, and indexed by WorldCat, Google Scholar, Cross ref, ProQuest, CABI.

# (Important Steps for your registration): Please do finish all the 6 steps on time to guarantee the paper published in the proceeding successfully:

1. Revise your paper according to the Review Comments in the attachment carefully. (Five authors at most each paper)



**2. Format your paper according to the Template carefully**. http://www.ijfe.org/uploadfile/2015/0825/20150825040522530.doc

## 3. Download and complete the Registration Form and

http://www.icfeb.org/reg.doc (English)

4. Finish the payment of Registration fee by Credit Card. (The information can be found in the Registration form)

http://www.icfeb.org/reg.doc (English)

## 5. Finish the Copyright Form

http://www.ijfe.org/uploadfile/2016/0318/20160318044922435.pdf

6. Send your final papers (both .doc and .pdf format), filled registration form (.doc format), copyright form (.jpg format) and the scanned payment (in .jpg format) to us at icfeb@cbees.org. (Before February 28, 2018) (Very important)

ICFEB 2018 will check the format of all the registered papers first, so the authors don't need to upload the paper to the system. After the registration, we will send all qualified papers to the publish house and index organization for publishing directly.

We are looking forward to meeting all the authors in our conference. But if you and your co-author(s) could not attend ICFEB 2018 to present your paper for some reasons, please inform us. And we will send you the proceeding or journal in electronic version and the scanned receipt after ICFEB 2018.

Please strictly adhere to the format specified in the conference template while preparing your final paper. If you have any problem, please feel free to contact us via **icfeb@cbees.org**. For the most updated information on the conference, please check the conference website at http://www.icfeb.org/. The Conference Program will be available at the website in **early March**, 2018.

Again, congratulations. I look forward to seeing you in Okinawa, Japan.

Yours sincerely,

## **ICFEB 2018 Organizing Committees**



http://www.icfeb.org/ ICFEB



Gemala Anjani <gemaanjani@gmail.com>

# Paper Revision\_ICFEB 2018

2 messages

**Gemala Anjani** <gemaanjani@gmail.com> To: icfeb@cbees.org Tue, Feb 27, 2018 at 10:47 AM

Dear Committee,

I would like to submit my revision full paper in ICFEB 2018 as I attach in this email. I wish it is not to late to send you today.

I have question about registration fee. In the registration form, it says "Please indicate your paper ID code in the payment, and return the registration form and scanned payment proof to icfeb@cbees.org before February 28, 2018 by e-mail attachment." Can i pay onsite?

Thank you very much,

Best regards, Gemala Anjani

## 2 attachments

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icfeb@cbees.org <icfeb@cbees.org> To: gemaanjani@gmail.com Tue, Feb 27, 2018 at 10:50 AM

Dear Colleague, Thank you for your email. The Organising Group will respond to your enquiry in three work days. If you have any questions regarding the conference please visit the website which will be updated with information on the conference as it becomes available.

Kindest Regards,

Organising Group ICFEB 2018

# Prohibited coloring agent in dominating hazardous street food around Elementary School in Semarang-Indonesia

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Abstract— Snack foods comprise ready-to-eat foods and beverages that are sold by traders. Street foods in Indonesia are often misused by adding hazardous substances those are prohibited or safe limits. The aim of this study was to understand the street food quality and safety in elementary schools in Semarang. This was an observational study conducted by a research technique of simple random sampling. The target of the study was snack foods sold around 32 elementary schools in the city of Semarang. The hazardous substances present in the food were qualitatively analyzed by an easy method using easy testing kits. There were four schools with no exposure to hazardous substances. In addition, rhodamine B is the most often substances added to snack foods primarily sauce, seasoning powder, and jam. The percentage of street foods containing preservatives (formalin and borax), coloring agents (rhodamine B and metanil yellow), and sweeteners (cyclamate and saccharin) is still high. Therefore, It is necessary to control the sales of street foods, especially those containing harmful food additives, to prevent food adulteration.

*Index Terms*—- street food, food adulteration, preservatives, coloring agents, sweetener

#### I. INTRODUCTION

Street food safety still needs attention because of the utilization of food additives that exceed the permissible concentration, thereby compromising the quality and microbiological safety requirements. Every year, the National Agency of Drug and Food Control reports about the use of formalin, borax, rhodamine B, and metanil yellow as food additives and the use of food additives that exceed the permissible concentration, such as benzoate and artificial sweeteners, in street foods. Street foods comprise ready-to-eat foods and beverages prepared and/or sold by vendors on the street surrounding the schools and are regularly consumed by most of the schoolchildren [1].

To provide access to safe food and nutritious street food, the government states that educational institutions must have facilities, including a canteen, in their schools. A research conducted by the Center for Physical Quality Development Ministry of Education on healthy schools in 2007, including 640 primary schools in 20 provinces, reported that 40% of schools did not have a canteen, whereas 60% of schools had a canteen and 84.3% of the canteens did not meet the health requirements [2].

The culture of eating snacks has become a part of life in almost all age groups and social classes, including school-age children and adolescents. A study conducted by Syafitri et al showed that frequency of student main food snack (3-5 times/week) equal to 44%. As many as 66% students have a snack frequency > 11 times/week, and 30% of students have a snack frequency of drinks 6-8 times/week [3]. As a routine, schoolchildren play and buy snack foods that are sold around the school. Consequently, the schoolchildren cannot be controlled by menus and nutritional food regarding any snacks purchased at the school, although the schools have rules for schoolchildren stating not to buy snack foods outside the school. However, in general, schools are very lenient toward this problem because of social and humanitarian factors. Moreover, the habit of eating street foods outside of school time is not monitored well, as a result of which the schoolchildren can buy food to street food vendors, which might containing harmful substances [4].

According to the results of supervision by the National Agency of Drug and Food Control in recent years, there are four types of hazardous substances that are often misused in foods, which include formalin, borax, rhodamine B, and metanil yellow [2]. Results of the survey conducted by the National Agency of Drug and Food Control throughout Indonesia in 2009 showed that 45% of street foods sold around schools were not edible as they contain harmful chemicals such as formalin, borax, rhodamine, cyclamate, and benzoate exceeding the safe limits [5]. Another survey conducted by the National Agency of Drug and Food Control during January-August 2014 reported that almost one-third of street foods eaten by 23,500 schoolchildren in primary schools and madrasah in Indonesia were contaminated with harmful microbes and contained hazardous substances and food additives. Earlier in 2011, the National Agency of Drug and Food Control also showed that 35.5% of street foods sold around the schools were inedible in terms of food safety [2]. The present study was conducted with the aim of observing the condition of street food vendors surrounding the schools in Semarang city.

#### II. METHODS

This was an observational study conducted in November and December in 2016 in Semarang city. The independent variables were formalin, borax, rhodamine B, metanil yellow, saccharin, and cyclamate. Street food samples were collected from 32 schools selected by simple random sampling. These samples included the foods sold around the schools.

The hazardous substances (formalin, borax, metanil yellow, saccharin, and cyclamate) present in the food samples were qualitatively tested at the Chemical Laboratory of Nutrition Sciences, Diponegoro University, using easy testing kits. Results of the analysis are presented in the descriptive form.

#### III. RESULTS AND DISCUSSION

## A. Results

Formalin, borax, rhodamine B, saccharin, and cyclamate were qualitatively analyzed using easy testing kits. Each food sample was tested three times repetitively. The samples were identified as positively containing hazardous substances if two of the repetitions showed positive results.

Table 1 shows the amount of hazardous substances detected in the tested street food samples. Among the hazardous substances that were added to foods, the mostly used substance was rhodamine B (55.13%).

TABLE 1. CHARACTERISTICS OF PRIMARY SCHOOL SNACK FOODS

Hazardous substances	n	Positive n (%)	Negative n (%)
Formalin	93	10 (10.75)	83 (89.25)
Borax	69	11 (15.94)	58 (84.06)
Rhodamine B	78	43 (55.13)	35 (44.87)
Metanil yel-	69	7 (10.14)	62 (89.86)
low			
Saccharin	25	2 (8.00)	23 (92.00)
Cyclamate	25	9 (36.00)	16 (64.00)

The types of food containing hazardous substances were not limited to only certain types of food as in table 2. Formalin and borax were used in foods prepared as a mix of meat as the ingredient, such as chicken and beef. Rhodamine B was used in a mixture of sauces and seasonings to enhance the red color of the food. Metanil yellow was used in a mixture of various foods. Among the types of foods containing meat, six samples tested positive for formalin (Table 3).

TABLE 2. FOODS CONTAINING HAZARDOUS SUBSTANCES

Hazardous	Type of food
substances	
Formalin	Meatballs, tempura, sempolan,
	gorengan, ayam
Borax	Meatballs, cilok, tahu bakso,
	batagor, dumpling, tempura
Rhodamine Bv	Sauce, seasoning powder, jams,
	nugget, otak-otak, tempura,
	corned, instant drinks
Metanil yellow	Terang bulan, sauce, corned, in-
-	stant drinks
Saccharin	Jams
Cyclamate	Instant drinks, <i>kinca</i> , jams, cake,
-	meizes, jelly, ice cream

	TABLE 3.	FORMA	ALIN POSITIVE F	FOODS
No	Type of food	n	Positive n %	Negative n %
1.	Meatballs	12	2 (16.67%)	10 (83.33%)
2.	Tempura	2	2 (100%)	-

1 (11.11%)

1 (100%)

3 (100%)

1(100%)

8 (88.89%)

9

1

3

1

3.

4.

5.

6.

Sausage

Sempolan

Gorengan

Ayam

Table 4 shows the types of snack foods tested positive
for borax. The results showed that meatballs, cilok, and
batagor were often prepared using borax as additive sub-
stance. Of the 15 meatball samples tested for borax con-
tent, 4 samples (26.67%) were found to be positive for
borax.

TABLE 4. BORAX POSITIVE FOODS

Type of food	Ν	Positive n %	Negative n %
Meatballs	15	4 (26.67%)	11 (73.33%)
Cilok	7	3 (42.86%)	4 (57.14%)
Tahu bakso	2	1 (50.00%)	1 (50.00%)
Batagor	3	1 (33.33%)	2 (66.67%)
Dumpling	6	1 (16.67%)	5 (83.33%)
Tempura	6	1 (16.67%)	5 (83.33%)

The type of street food mostly containing rhodamine B was the seasoning powder. Of the 14 samples tested, 10 samples (71.43%) were found to contain rhodamine B. Other food types that often contained rhodamine B were sauces (53.33%) and jams (66.67%) (Table 5).

TABLE 5. RHODAMINE B POSITIVE FOODS

Type of food	n	Positive n %	Negative n %
Sauce	30	16 (53.33%)	14 (46.67%)
Seasoning	14	10 (71.43%)	4 (28.57%)
powder			
Jam	6	4 (66.67%)	2 (33.33%)
Nugget	3	3 (100%)	-
Otak-otak	1	1 (100%)	-
Tempura	2	1 (50%)	1 (50%)
Instant drinks	5	4 (80%)	1 (20%)
Ice cream "X"	1	1 (100%)	-
strawberry			
Corned	1	1 (100%)	-
Cotton candy	2	1 (50%)	1 (50%)

Regarding the additive substance metanil yellow, it was observed that food types such as terang bulan, corned, and instant drinks contained metanil yellow. In addition, of the 15 sauce samples tested, 2 samples (13.33%) were positive for metanil yellow (Table 6).

TABLE 6. METANIL YELLOW POSITIVE FOODS

Type of food	n	Positive n %	Negative n %
Terang bulan	2	2 (100)	-
Sauce	15	2 (13.33%)	13 (86.67%)
Corned	1	1 (100%)	-
Instant drinks	1	1 (100%)	-

Analysis of five jam samples revealed that two samples (40%) were positive for saccharin (Table 7). Table 8 shows the presence of cyclamate in each (100%) of the six food types of the total eight food types tested. This result was observed because only one sample for each of the six food types was tested for cyclamate.

TABLE 7. SACCHARIN POSITIVE FOODS

No	Type of food	n	Positive n %	Negative n %
1.	Jam	5	2 (40%)	3 (60%)

ABEE 6. CICEAMATETOSITIVE TOOD	TABLE 8.	CYCLAMATE POSITIVE	FOOD
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No	Type of food	n	Positive n %	Negative n %
1.	Tea	2	1 (50%)	1
2.	Kinca	1	1 (100%)	-
3.	Instant drinks	3	2 (66.67%)	1 (33.33%)
4.	Kuah pem- pek	1	1 (100%)	-
5.	Jam	4	1 (25%)	3
6.	Ice cream "X" straw- berry	1	1 (100%)	-

7.	Bolu kukus	1	1 (100%)	-
8.	Meizes	1	1 (100%)	-

Based on the distribution data of schools in the city, schools that were highly exposed to street foods containing hazardous substances were SD 8, SD 5, SD 6, SD 9, SD 12, and SD 18 (Table 9).

TABLE 9. DISTRIBUTION OF HAZARDOUS-SUBSTANCE-CONTAINING STREET FOODS AROUND THE SCHOOLS

School name	For ma- lin	Bo rax	Rho da- min e B	Me- tanil yel- low	Sac- char- in	Cy- clama te	Total
ES 1	0	0	0	0	0	0	0
ES 2	0	0	0	0	0	1	1
ES 3	0	0	1	0	0	0	1
ES 4	0	0	2	0	0	0	2
ES 5	1	0	2	1	1	0	5
ES 6	1	1	1	2	0	0	5
ES 7	0	0	2	0	0	0	2
ES 8	4	2	2	0	0	1	9
ES 9	1	0	3	0	0	1	5
ES 10	0	0	2	0	0	0	2
ES 11	1	1	1	0	0	0	3
ES 12	1	0	2	0	0	1	4
ES 13	0	0	0	0	0	0	0
ES 14	0	1	0	0	0	1	2
ES 15	0	0	2	0	0	1	3
ES 16	1	0	0	1	0	0	2
ES 17	0	1	1	0	0	0	2
ES 18	0	0	5	0	0	0	5
ES 19	0	0	0	0	0	0	0
ES 20	0	2	2	0	0	0	4
ES 21	0	2	2	0	0	0	4
ES 22	0	0	1	2	0	1	4
ES 23	0	0	2	0	0	0	2
ES 24	0	0	2	0	0	1	3
ES 25	0	0	1	0	0	0	1
ES 26	0	0	1	0	0	0	1
ES 27	0	0	3	0	0	1	4
ES 28	0	0	0	1	0	0	1
ES 29	0	0	1	0	0	0	1
ES 30	0	0	0	0	0	0	0
ES 31	0	0	1	0	0	0	1
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\*ES = Elementary School

#### B. Discussion

#### 1) School description

Of the 32 schools targeted, four schools showed 0% exposure to hazardous substances in foods, implying that the street foods sold around the schools contained no hazardous substances such as formalin, borax, rhodamine B, metanil yellow, saccharin, and cyclamate. Three schools that were located near the city had a clean school environment, comprising children from the upper middle class. Another school was located near the market and had children from the middle-income class.

2) Characteristics of street foods and hazardous substances

#### a) Preservatives

Food safety issues, particularly those of street foods around the schools, have become a focus of the government of Indonesia. The government had issued regulations for the ban of the use of harmful or hazardous substances, such as the ban on the use of formalin and borax listed in the Regulatory of Health Minister No. 033 of 2012 as food additives. In the present study, 10 of the 93 samples tested for formalin were found to contain formalin. The types of food containing formalin were sausages, meatballs, tempura, gorengan, and sempolan. Gorengan was a new finding in this study because this food type is generally prepared without using preservatives, which indicates that the use of formalin in food become more varies. A study conducted by Paratmanitya et al showed that of the 98 samples of street foods tested, 25 samples (25.5%) tested positive for formaldehyde, which included meatballs, sausages, dumplings, tempura, and noodles [6].

Formalin acts as an antibacterial agent that can slow down the activity of bacteria in foods containing excessive protein; formalin reacts with the protein in food and makes the food last longer. High formalin content in the body can cause abdomen irritation, allergic and carcinogenic effects, changes in the function of cells/tissues, vomiting, and deaths due to circulatory failure [7].

In this study, 11 samples of the 69 food samples tested were found to be positive for borax. Foods containing borax included meatballs, tahu bakso, cilok, batagor, dumplings, and tempura. In other cities, vendors also add harmful substances as a mixture of borax in street foods. In Bantul, of the 98 samples of street foods tested, 15 samples (15.3%) were positive for borax. These foods included meatballs, meatball chips, tempura, noodles, tahu bakso, and kerupuk. Borax was reportedly used as a food preservative in some foods containing meat and dairy products. This is because borax is able to inhibit the growth of microorganisms, so that the food can stay fresh and last longer. Moreover, the addition of borax is believed to control the gelatinization of starch, as well as improve the color, texture, and taste of the food [8].

## b) Coloring agents

In the present study, of the 78 samples tested, 43 samples were positive for rhodamine B. The types of foods

containing rhodamine B were seasoning powder, sausages, jams, instant drinks, nuggets, otak-otak, tempura, and ice cream "X" strawberry. In other areas also, there is an increase in the use of rhodamine B in street foods. Paratmanitya et al reported that street foods in Bantul such as jelly, es cendol, syrup, sauces, and ice purple contained rhodamine B [6].

The increasing use of rhodamine B in food products could be due to its inexpensiveness compared with the cost of permitted food dyes. Another reason could be the lack of knowledge among domestic industrial producers regarding which coloring agent is allowed for use in foods [9]. Prohibiting the use of rhodamine B was regulated by Joit Regulation of Ministry of Internal Affairs and Head of National Agency of Drug and Food Control No. 43 of 2013 and No. 2 of 2013 [10]. Rhodamine B could cause carcinogenic effects and increase lipid peroxidation as a sign of oxidative stress.

Of the 69 food samples tested, there were 7 positive samples containing metanil yellow. The types of food tested positive for metanil yellow included terang bulan, corned, sauces, and instant drinks. Prohibiting the use of metanil yellow was regulated by the Regulation of the Ministry of Health No.239/Men.Kes/Per/V/85. Metanil yellow was banned from use in foods because it could cause toxic effects in the body [11]. However, currently, metanil yellow is widely used as a yellow coloring agent in foods because it is relatively inexpensive with bright and flashy colors [12].

Metanil yellow accumulates in the liver and affects free radicals, which could cause oxidative stress resulting in damage to the liver cells. Metanil yellow also has neurotoxic effects and causes lipid peroxidation, which indicates that metanil yellow affects the integrity of the cell membrane resulting in damage to the liver cells [13].

#### c) Sweeteners

Of the 25 samples tested for saccharin, there were 2 positive samples containing saccharin, which included jams. Like other harmful substances, saccharin was also found in street foods in other areas. In a school in Pekalongan, saccharin was found in street foods such as es cendol, chocolate wafers, and powder drink flavors. The use of saccharin in street foods was as much as 0.0005-1.3295 mg per serving. Saccharin is an artificial sweetener that has been widely used in foods and beverages without the extra calories. In addition, the sweetness level of saccharin is 300 times more than that of regular sugar. Saccharin is considered safe for consumption by the FDA (Food and Drug Administration) since it is not biologically absorbed or metabolized [14]. It is excreted through the kidneys without any abnormalities. The amount of saccharin that can be used in foods as recommended by the ADI (Acceptable Dietary Intake) is 0.5 mg/kg [15]. The maximum limit of the use of saccharin in foods is regulated by the government as listed in the National Agency of Drug and Food Control Chief Regulation No. 4 of 2014 about Maximum Limit Use of Sweetners Food Additives. The maximum limit of saccharin is 200 mg/kg in food items such as jams, jellies, and marmalades; 120 mg/kg in different types of drinking water-based flavors, not carbonated, including punches; and 300 mg/kg in other sugars and syrups (e.g., xylose, maple syrup, and confectionery sugar), types of table syrups (e.g., maple syrup), syrups used in bakery products and ice ornament (caramel syrup, flavored syrups), and sugar for cake decoration (e.g., colored sugar crystals for cookies) [16].

Regarding cyclamate, of the 25 food samples tested, 9 samples were positive for cyclamate. Another study reported that cyclamate was found in instant beverages sold in schools. In addition, cyclamate was found in foods such as cracker snacks, biscuits, chocolate wafers, and powder drink flavors. Cyclamate has a negative effect on health if it is continuously consumed for a long time. Takayama et al showed that cyclamate has carcinogenic effects that can lead to malignant cancer cells [17]. Cyclamate use has been prohibited by the National Agency of Drug and Food Control as an artificial sweetener in foods since 2014. However, traders still often use cyclamate in foods because of its high sweet taste (30–50 times sweeter than cane sugar), which could save the cost for sugar as a natural sweetener [18].

The maximum limit of the use of cyclamate was regulated by National Agency of Drug and Food Control No. 4 of 2014 about Food Additives. The maximum limit of cyclamate is 1000 mg/kg in food items such as jams, jellies, and marmalades; 500 mg/kg in food confectioneries/sweets, including confectionery/hard and soft candy and nougat; and 500 mg/kg in other sugars and syrups (e.g., xylose, maple syrup, and sugar ornamental), types of table syrups (e.g., maple syrup), syrups used for decoration of products in bakery and ice products (syrups, caramel, flavored syrups), and sugars used for cake decoration (e.g., colored sugar crystals for cookies)[16].

#### 3) Analysis of Food Producers

The types of street foods sold around the schools can be grouped into self-produced foods made by home industries and foods derived from medium-scale industries. Foods analyzed in this study that could be homemade were batagor, dumplings, sempolan, terang bulan, meatballs, cilok, and tempura. Seasoning powder, sauces, jams, and instant drinks were produced by a medium scale industry (the processed plant). Most of the jams and sauces did not have indications of codes, labels, brands, types, composition, or other data associated with that product.

The addition of hazardous substances; preservatives such as formalin and borax commonly applied by food traders directly to the food. which was sold while the additional material, such as seasoning powder, sauce, butter were added to the main food sold, produced by medium scale industries, and street vendors only use the product. Food producers usually mixed the hazardous substances such as rhodamine B, metanil yellow, saccharin, and cyclamate into the product as an additional material. The reason for using harmful synthetic dyes in foods was that they were less expensive and produced more attractive colors compared with safe food dyes. Moreover, the addition of sweeteners was also aimed at reducing production costs. The government has been implementing food safety programs in all industries, including household industries. Unfortunately, these sectors have the highest risk for malpracticing food quality and safety standards. These producers contribute approximately >20% to the total national food consumption, and, especially in urban areas, they could be considered as important contributors to the food supply chains for adults and children [19].

Food adulteration is an unethical business practice. It may occur at any time or any layer along the entire supply chain of the food, from the producer to the consumer and from "Farm to Fork." Any food or food product may reach from the farmer or its producer by the following methods:

- Directly to the hands of the consumers or
- · First to retailers and then to consumers or
- First to wholesalers, then to retailers, and at last to consumers or
- First to local agents or brokers, then to manufacturers, later on to wholesalers, then to retailers, and at last to consumers, etc.

Therefore, food adulteration may occur in any of the layers or steps in the process of reaching the food from the farm or production to the fork of the consumers, as shown above. Any one or several of the farmers/producers, retailers, wholesalers, manufacturers, agents/brokers may cause the adulteration of food in a way of adding an adulterant, removing or reducing and substituting any element thereto, or false representation of any item as food with the intention of malice of extra profit-making [20].

Trading system settings do not guarantee the safety of hazardous substances in the market because the distribution of hazardous substances is indicated at approximately 3%–4% of the production of hazardous substances (formalin) into the consumer market, especially smallscale food industries. Leakage of formalin into the consumer market can be triggered by several factors such as utilization of excess production, the uncertainty in the cost of storage business in the small business sector (SME), and weak supervision, in addition to illegal trafficking of hazardous substances due to businesses having problems in obtaining a business license [21].

#### IV. CONCLUSIONS

The percentage of street foods containing preservatives (formalin and borax), coloring agents (rhodamine B and metanil yellow), and sweeteners (cyclamate and saccharin) is high. The types of foods containing preservatives identified in this study included meatballs and tempura, while those containing coloring agents included spices, jams, and sauces. Sweetener-containing food types were instant drinks and jams. Hence, it is necessary to control the production and sales of street foods, especially foods that are often found to contain harmful chemicals, to prevent food adulteration. Adulteration of food may occur at any time or any layer along the entire supply chain of the food, from the producer to the consumer.

#### ACKNOWLEDGEMENT

This research was funded by Center of Nutrition Research (CENURE), Diponegoro University. We would like to thank to Researcher of Department of Nutrition Science, Diponegoro University. Also thanks to Lembaga Penelitian dan Pengabdian (LPPM), Diponegoro University.

#### REFERENCES

- [1] Ministry of Health Republic of Indonesia (Kemenkes RI). Schoolchildren Street Food. Jakarta: Jejaring Informasi Pangan dan Gizi; 2011.
- [2] Directorate of Nutrition. Guidelines For Safety Food in Primary School. Jakarta: General Directorate of Maternal and Child Nutrition Ministry of Health Republic of Indonesia; 2011. 1-76 p.
- [3] Syafitri Y, Syarief H, Yayuk Farida Baliwati. Snacking Habits Among Elementary School Student, Case Study in SDN Lawanggintung 01 Bogor. Jurnal Gizi dan Pangan. 2009;4(3):167-75.
- [4] Karimah FA, Sirajuddin S, Zakaria. Analysis of Synthetic Dyes Substances in Food Snacks Primary School Lariangbangi Makassar. In: Nutrition College PHF, University of Hasanuddin, editor. 2014. p. 1-8.
- [5] National Agency of Drug and Food Control Republic of Indonesia (BPOM RI). Schoolchlidren Street Food. Jakarta: National Agency of Drug and Food Control Republic of Indonesia (BPOM RI); 2009.
- [6] Paratmanitya Y, Aprilia V. Harmful food additive substances content in the snack food of elementary school children in Bantul. Jurnal Gizi dan Dietetik Indonesia. 2016;4:49-56.
- [7] Iftriani I, Wahyuni S, Amin H. Formalin Analysis in Tofu in Tradisional Market in Kendari. Jurnal Sains dan Teknologi Pangan. 2016;1:129.
- [8] See AS, Salleh AB, Bakar FA, Yusof NA, Abdulamir AS, Heng LY. Risk and Health Effect of Boric Acid. American Journal of Applied Sciences. 2010;7(5):620-7.
- [9] Silalahi J, Rahman F. Analysis of Rhodamine B in Schoolchildren Street Food in Labuhan Batu Regency, North Sumatra. Jurnal Indonesia Medical Association. 2011;61:293-8.
- [10] Monitoring of Hazardous Substances That are Misused in Food, 2 (2013).
- [11] Food Additives, 33 (2012).
- [12] Cahyadi W. Analysis and Health Aspect of Food Additives. Jakarta: Bumi Aksara; 2008.
- [13] Hazra S, Dome R, Ghosh S, Ghosh D. Protective Effect of Methanolic Leaves Extract of *Coriandrum* sativum Against Metanil Yellow Induced Lipid Peroxidation in Goat Liver: An *In vitro* Study. International Journal of Pharmacology and Pharmaceutical Science. 2016;3(5):41.
- [14] US Food and Drug Administration. Additional Information About High Intensity Sweeteners Permitted for Use in Food in the United States United States: US Department of Health and Human Services; 2015 [updated May, 26th 2015; cited

2017]. Available from: https://<u>www.fda.gov/food/ingredientspackaginglabel</u> ing/foodadditivesingredients/ucm397725.htm.

- [15] Whitehouse CR, Boullata J, McCauley LA. The Potential Toxicity of Artificial Sweeteners. American Association of Occupational Health Nurse. 2008;56(6):251-9.
- [16] Maximum Limit Use of Sweeteners Food Additives, 4 (2014).
- [17] Takayama S, Renwick G, Johansson SL, Thorgeirsson UP, Tsutsumi M, Sieber SM. Long Term Toxicity and Carcinogenicity Study of Cyclamate in Nonhuman Primates. Toxicol Science. 2000;53:33-9.
- [18] Smith J, L HS. Food Additives Data Book. United States: John Wiley & Sons; 2008.
- [19] Puspa J, Kuhl P. Food Quality and Safety Measures and Controls: The Future Challenge for Indonesia. International Agricultural Research for Development; University of Kassel-Witzenhausen and University of Gottingen2007.
- [20] Sobhani MM. Food Adulteration: The Bangladesh Paradox. Law Journal Bangladesh. 2015;2.
- [21] Ministry of Trade. Distribution Control Analysis of Hazardous Substances. Jakarta: Ministry of Trade; 2013.



**Gemala Anjani** was born in Klaten, Juny 18<sup>th</sup> 1980. From 1998 to 2003 Gemala studied and graduated from Nutrition major, Bogor Agricultural University in Indonesia. At 2008, Gemala received a master degree in Bogor Agricultural University. And she received a Doctor's degree at Kanazawa University, Japan in

2014. After graduation on 2003, she began work in Department of Nutrition Science, Faculty of Medicine, Diponegoro University as Lecturer. She previous research interest were genistein in caseinate and liposome system. Currently in addition to this, fortification vitamin B12 and D3 on kefir and kefiran. Dr. Gemala is member of Persatuan Ahli Teknologi Pangan Indonesia (PATPI).



**Ninik Rustanti** was born in Jepara, Juny 25<sup>th</sup> 1978. From 1996 to 2000, Ninik studied and graduated from Bogor Agricultural University. And she awarded a master degree at Diponegoro University in 2009. She previous research interest were developed the functional food. Mrs. Ninik is a member Persatuan Ahli Teknologi Pangan Indonesia (PATPI). In 2015, Mrs. Ninik awarded as Author of International Journal of Reputation from Dipone-

goro University.



Hartanti Sandi Wijayanti was born in Semarang, February 7<sup>th</sup> 1985. From 2003 to 2007, Hartanti studied and graduated from Nutrition Science in Diponegoro University Indonesia. In 2013 Hartanti received a master degree from SEAMEO-RECFON in Indonesia. After graduation, she began work in Department of Nutrition Science, Faculty of Medicine, Diponegoro University. She previous research interest were Community Nutri-

tion, focusing on Maternal and Child Nutrition. Mrs. Hartanti is member

of Persatuan Ahli Gizi Indonesia (Persagi) and Perhimpunan Pakar Gizi dan Pangan Indonesia (Pergizi Pangan).



**Trisna Suryaningrum** was born in Semarang Regency, Central Java Province, Indonesia, in January 5<sup>th</sup> 1994. From September 2012 to August 2016, Trisna studied and graduated from Nutrition Science, Diponegoro University in Indonesia. Her research field in major is glycemic index on flakes modification between pumpkin flour and mocaf flour. Her work experience as Laboratory Assisst and Practicum Assisst in Food Chemistry and

Food Technology courses.



**Diana Nur Afifah** was born in Semarang, July 31<sup>st</sup> 1980. From 1998 to 2003 Diana studied and graduated from Food Technology, Bogor Agricultural University in Indonesia. At the age age of 27 Diana received a master degree in Diponegoro University. And she received a Doctor's degree at Bogor Agricultural University Sandwich-like with Gyeongsang National

University in 2015. Her research field is Fibrinolytic Protease from Microbials of Red Oncom Fermented Foods and Tempe Gembus. After graduation, she began work in Department of Nutrition Science, Faculty of Medicine, Diponegoro University as Lecturer. She previous research interest were bioactive peptide and protein from tempe gembus (fermented food) and fortification on kefir. Currently in addition to this, Starch resistant on Pisang Batu (*Musa balbisiana colla*) enzymatic modified for functional food ingredient. Dr. Diana were member of Persatuan Ahli Gizi Indonesia (PATPI) from 2008 until now.



Gemala Anjani <gemaanjani@gmail.com>

# **Complete submission for ICFEB 2018**

9 messages

**Gemala Anjani** <gemaanjani@gmail.com> To: icfeb@cbees.org Tue, Feb 27, 2018 at 3:36 PM

Dear Committee,

I'm sending my complete registration form, final abstract (ID: C3002), final paper (ID: C3004), and copyright transfer agreement as I attach in this email. For information, I will attend my self of both. And I will pay on site. I'm waiting for your Invitation Letter.

Thankyou very much,

Best Regards, Gemala Anjani

## 8 attachments

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## icfeb@cbees.org <icfeb@cbees.org> To: Gemala Anjani <gemaanjani@gmail.com>

## Dear Gemala,

I will apply for the invitation letter from Hong Kong Headquarter. Because we will send the invitation letter to the person who already register. I did not know if the invitation letter from Hong Kong Headquarter will help you to get the visa.

Bset regards,

Ms. Zero Jiang

**Conference Specialist** 

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Kowloon, Hong Kong

[Quoted text hidden]

**Gemala Anjani** <gemaanjani@gmail.com> To: "icfeb@cbees.org" <icfeb@cbees.org> Tue, Feb 27, 2018 at 4:13 PM

Dear Committee,

Thankyou for the information, we will try to apply visa as visa tourist. If it is not possible to apply visa from Hongkong Headquarter. Or you mean that we should pay first before we get the invitation letter? I would like to confirm again about the venue of the conference. So is it will be held in Ryukyu University, Faculty of Engineering? Because we will try find the accomodation around that place or if you further information please inform us.

Thankyou very much,

Best Regards, Gemala Anjani [Quoted text hidden]

icfeb@cbees.org <icfeb@cbees.org> To: gemaanjani@gmail.com

[Quoted text hidden]

icfeb@cbees.org <icfeb@cbees.org> To: Gemala Anjani <gemaanjani@gmail.com>

Dear Gemala,

I will apply the invitation letter and the result will come out tomorrow or the day after tomorrow. Please wait for it. I will send it to you directly if it was possible to send you invitation letter before your registration. Best regards, [Quoted text hidden]

icfeb@cbees.org <icfeb@cbees.org> To: Gemala Anjani <gemaanjani@gmail.com> Wed, Feb 28, 2018 at 10:48 AM

Dear Gemala,

Tue, Feb 27, 2018 at 4:13 PM

Tue, Feb 27, 2018 at 4:19 PM

I have apply for the invitation letter, unfortunately, the result is negative. Because we only send the invitation letter to the person who already pay the registration fee. Maybe you can apply for the tourist visa and pay the registration fee on site. If there are any positive results, please inform me timely. I'm preparing the conference schedule and will send it to the authors on March 12, 2018. Thanks for your support to ICFEB 2018. Wish to see you in Okinawa, Japan.

[Quoted text hidden]

Gemala Anjani <gemaanjani@gmail.com> To: "icfeb@cbees.org" <icfeb@cbees.org> Wed, Feb 28, 2018 at 12:17 PM

Dear Committe,

Thankyou for your information. For information, we just call embassy and we can apply tourist visa with Acceptance Letter they say that.

Thankyou very much,

Best Regards, Gemala Anjani



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[Quoted text hidden]

icfeb@cbees.org <icfeb@cbees.org> To: gemaanjani@gmail.com Wed, Feb 28, 2018 at 12:17 PM

[Quoted text hidden]



Gemala Anjani <gemaanjani@gmail.com>

# C3004-FINAL CONFIRMATION

4 messages

Fri, May 11, 2018 at 4:44 PM

icfeb@cbees.org <icfeb@cbees.org> To: Gemala Anjani <gemaanjani@gmail.com>

Dear Gemala,

This is Zero. Hope your everything goes well.

And I have received the message from the IJFE editors, they told me they format your paper according to IJFE template carefully and need you to confirm the paper in attachment. If the content is in accordance with the one you sent to us, it will be regarded as the final paper and will be used to publication. Wish to receive your reply within 3 days.

Best regrads,

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**Gemala Anjani** <gemaanjani@gmail.com> To: "trisnasuryaningrum@gmail.com" <trisnasuryaningrum@gmail.com> Fri, May 11, 2018 at 7:34 PM

Sat, May 12, 2018 at 7:36 PM

Sent from my iPhone

Begin forwarded message:

[Quoted text hidden]



Gemala Anjani <gemaanjani@gmail.com> To: "icfeb@cbees.org" <icfeb@cbees.org>

Dear Ms. Zero

Thank you for the email.

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5/4/23, 5:15 PM

I have read and agree for this final writing.

Regards

Gemala

[Quoted text hidden]

<C3004.doc>

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Gemala Anjani <gemaanjani@gmail.com>

## About my article again

3 messages

**Gemala Anjani** <gemaanjani@gmail.com> To: "icfeb@cbees.org" <icfeb@cbees.org> Fri, Dec 14, 2018 at 7:08 AM

Dear committe,

I again would like to confirm about my article. I submit it for the ICFEB conference in Okinawa March 2018.

My paper ID in the abstract book is C3004 : Prohibited Coloring agent in Dominating hazardous street food around elementary school in Semarang Indonesia. By : Gemala Anjani et al.

I cannot find my article which published on this Desember 2018.

I really need to get the information from you soon.

Best Regards

Gemala Anjani

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icfeb <icfeb@cbees.org> To: Gemala Anjani <gemaanjani@gmail.com> Wed, Jan 2, 2019 at 2:44 PM

Fri, Dec 14, 2018 at 7:10 AM

Dear Gemala Anjani,

Happy new year!

I have contacted withh IJFE, But I haven't receive the answer now. I will inform you as soon as possible. Best regards,

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Ms. Dana Huang Conference Specialist ICFEB 2019-http://www.icfeb.org Conference e-mail: icfeb@cbees.org Tel: +86-28-86528465 (China Branch) +1-206-456-6022 (USA) +852-3500-0137 (Hong Kong) HKCBEES Headquarter Address: Unit B, 6/F, Dragon Industrial Building, 93 King Lam Street, Lai Chi Kok, Kowloon, Hong Kong

====== 2018-12-14 08:12:19 gemaanjani@gmail.com在来信中写道: =======

主题: About my article again

发件人: Gemala Anjani <gemaanjani@gmail.com>

日期: Fri, December 14, 2018 8:08 am

收件人: icfeb <icfeb@cbees.org>

\_\_\_\_\_

[Quoted text hidden]



Gemala Anjani <gemaanjani@gmail.com>

Wed, Nov 7, 2018 at 4:54 PM

# Paper published

5 messages

Gemala Anjani <gemaanjani@gmail.com> To: icfeb@cbees.org

Dear ICFEB committee,

My name is Gemala Anjani, I join the ICFEB conference on March 2018 in Okonawa. Could you please let me know when is my paper published? is it for this month series? Thank you for the information.

Best regards,

Gemala Anjani Department of Nutrition Science Faculty of Medicine, Diponegoro University Indonesia JI Prof H. Soedarto, SH-Tembalang Semarang Telp/Fax +62 24 76402881

icfeb@cbees.org <icfeb@cbees.org> To: gemaanjani@gmail.com

Dear Colleague,

Thank you for your email.

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Kindest Regards,

Organising Group ICFEB 2019

icfeb <icfeb@cbees.org> To: Gemala Anjani <gemaanjani@gmail.com> Mon, Nov 12, 2018 at 5:48 PM

Wed, Nov 7, 2018 at 4:55 PM

Dear Gemala Anjani,

I am sorry that reply you so late. Could you tell me your paper ID? So I could ask the journal for process. Looking forward to hearing from you.

If you need more information about the conference, please visit our website http://www.icfeb.org

Ms. Dana Huang Conference Specialist ICFEB 2019-http://www.icfeb.org Conference e-mail: icfeb@cbees.org Tel: +86-28-86528465 (China Branch) +1-206-456-6022 (USA) +852-3500-0137 (Hong Kong) Gmail - Paper published

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# Prohibited Coloring Agent in Dominating Hazardous Street Food around Elementary School in Semarang-Indonesia

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Abstract-Snack foods comprise ready-to-eat foods and beverages that are sold by traders. Street foods in Indonesia are often misused by adding hazardous substances those are prohibited or safe limits. The aim of this study was to understand the street food quality and safety in elementary schools in Semarang. This was an observational study conducted by a research technique of simple random sampling. The target of the study was snack foods sold around 32 elementary schools in the city of Semarang. The hazardous substances present in the food were qualitatively analyzed by an easy method using easy testing kits. There were four schools with no exposure to hazardous substances. In addition, rhodamine B is the most often substances added to snack foods primarily sauce, seasoning powder, and jam. The percentage of street foods containing preservatives (formalin and borax), coloring agents (rhodamine B and metanil yellow), and sweeteners (cyclamate and saccharin) is still high. Therefore, It is necessary to control the sales of street foods, especially those containing harmful food additives, to prevent food adulteration.

*Index Terms*—street food, food adulteration, preservatives, coloring agents, sweetener

## I. INTRODUCTION

Street food safety still needs attention because of the utilization of food additives that exceed the permissible concentration, thereby compromising the quality and microbiological safety requirements. Every year, the National Agency of Drug and Food Control reports about the use of formalin, borax, rhodamine B, and metanil yellow as food additives and the use of food additives that exceed the permissible concentration, such as benzoate and artificial sweeteners, in street foods. Street foods comprise ready-to-eat foods and beverages prepared and/or sold by vendors on the street surrounding the schools and are regularly consumed by most of the schoolchildren [1].

To provide access to safe food and nutritious street food, the government states that educational institutions must have facilities, including a canteen, in their schools. A research conducted by the Center for Physical Quality Development Ministry of Education on healthy schools in 2007, including 640 primary schools in 20 provinces, reported that 40% of schools did not have a canteen, whereas 60% of schools had a canteen and 84.3% of the canteens did not meet the health requirements [2].

The culture of eating snacks has become a part of life in almost all age groups and social classes, including school-age children and adolescents. A study conducted by Syafitri et al showed that frequency of student main food snack (3-5 times/week) equal to 44%. As many as 66% students have a snack frequency > 11 times/week, and 30% of students have a snack frequency of drinks 6-8 times/week [3]. As a routine, schoolchildren play and buy snack foods that are sold around the school. Consequently, the schoolchildren cannot be controlled by menus and nutritional food regarding any snacks purchased at the school, although the schools have rules for schoolchildren stating not to buy snack foods outside the school. However, in general, schools are very lenient toward this problem because of social and humanitarian factors. Moreover, the habit of eating street foods outside of school time is not monitored well, as a result of which the schoolchildren can buy food to street food vendors, which might containing harmful substances [4].

According to the results of supervision by the National Agency of Drug and Food Control in recent years, there are four types of hazardous substances that are often misused in foods, which include formalin, borax,

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rhodamine B, and metanil yellow [2]. Results of the survey conducted by the National Agency of Drug and Food Control throughout Indonesia in 2009 showed that 45% of street foods sold around schools were not edible as they contain harmful chemicals such as formalin, borax, rhodamine, cyclamate, and benzoate exceeding the safe limits [5]. Another survey conducted by the National Agency of Drug and Food Control during January-August 2014 reported that almost one-third of street foods eaten by 23,500 schoolchildren in primary schools and madrasah in Indonesia were contaminated with harmful microbes and contained hazardous substances and food additives. Earlier in 2011, the National Agency of Drug and Food Control also showed that 35.5% of street foods sold around the schools were inedible in terms of food safety [2]. The present study was conducted with the aim of observing the condition of street food vendors surrounding the schools in Semarang city.

## II. METHODS

This was an observational study conducted in November and December in 2016 in Semarang city. The independent variables were formalin, borax, rhodamine B, metanil yellow, saccharin, and cyclamate. Street food samples were collected from 32 schools selected by simple random sampling. These samples included the foods sold around the schools.

The hazardous substances (formalin, borax, metanil yellow, saccharin, and cyclamate) present in the food samples were qualitatively tested at the Chemical Laboratory of Nutrition Sciences, Diponegoro University, using easy testing kits. Results of the analysis are presented in the descriptive form.

## III. RESULTS AND DISCUSSION

## A. Results

Formalin, borax, rhodamine B, saccharin, and cyclamate were qualitatively analyzed using easy testing kits. Each food sample was tested three times repetitively. The samples were identified as positively containing hazardous substances if two of the repetitions showed positive results.

Table I shows the amount of hazardous substances detected in the tested street food samples. Among the hazardous substances that were added to foods, the mostly used substance was rhodamine B (55.13%).

TABLE I. CHARACTERISTICS OF PRIMARY SCHOOL SNACK FOODS

Hazardous substances	n	Positive n (%)	Negative n (%)
Formalin	93	10 (10.75)	83 (89.25)
Borax	69	11 (15.94)	58 (84.06)
Rhodamine B	78	43 (55.13)	35 (44.87)
Metanil yellow	69	7 (10.14)	62 (89.86)
Saccharin	25	2 (8.00)	23 (92.00)
Cyclamate	25	9 (36.00)	16 (64.00)

The types of food containing hazardous substances were not limited to only certain types of food as in Table II. Formalin and borax were used in foods prepared as a mix of meat as the ingredient, such as chicken and beef. Rhodamine B was used in a mixture of sauces and seasonings to enhance the red color of the food. Metanil yellow was used in a mixture of various foods. Among the types of foods containing meat, six samples tested positive for formalin (Table III).

TABLE II. FOODS CONTAINING HAZARDOUS SUBSTANCES

Hazardous substances	Type of food	
Formalin	Meatballs, tempura, sempolan, gorengan, ayam	
Borax	Meatballs, cilok, tahu bakso, batagor, dumpling, tempura	
Rhodamine Bv	Sauce, seasoning powder, jams, <i>nugget</i> , <i>otak-otak</i> , <i>tempura</i> , corned, instant drinks	
Metanil yellow	Terang bulan, sauce, corned, instant drinks	
Saccharin	Jams	
Cyclamate	Instant drinks, <i>kinca</i> , jams, cake, <i>meizes</i> , jelly, ice cream	

TABLE III. FORMALIN POSITIVE FOODS

No	Type of food	n	Positive n %	Negative n %
1.	Meatballs	12	2 (16.67%)	10 (83.33%)
2.	Tempura	2	2 (100%)	-
3.	Sausage	9	1 (11.11%)	8 (88.89%)
4.	Sempolan	1	1 (100%)	-
5.	Gorengan	3	3 (100%)	-
6.	Ayam	1	1 (100%)	-

Table IV shows the types of snack foods tested positive for borax. The results showed that meatballs, cilok, and batagor were often prepared using borax as additive substance. Of the 15 meatball samples tested for borax content, 4 samples (26.67%) were found to be positive for borax.

TABLE IV. BORAX POSITIVE FOODS

Type of food	Ν	Positive n %	Negative n %
Meatballs	15	4 (26.67%)	11 (73.33%)
Cilok	7	3 (42.86%)	4 (57.14%)
Tahu bakso	2	1 (50.00%)	1 (50.00%)
Batagor	3	1 (33.33%)	2 (66.67%)
Dumpling	6	1 (16.67%)	5 (83.33%)
Tempura	6	1 (16.67%)	5 (83.33%)

The type of street food mostly containing rhodamine B was the seasoning powder. Of the 14 samples tested, 10 samples (71.43%) were found to contain rhodamine B.

Other food types that often contained rhodamine B were sauces (53.33%) and jams (66.67%) (Table V).

Type of food	n	Positive n %	Negative n %
Sauce	30	16 (53.33%)	14 (46.67%)
Seasoning powder	14	10 (71.43%)	4 (28.57%)
Jam	6	4 (66.67%)	2 (33.33%)
Nugget	3	3 (100%)	-
Otak-otak	1	1 (100%)	-
Tempura	2	1 (50%)	1 (50%)
Instant drinks	5	4 (80%)	1 (20%)
Ice cream "X" strawberry	1	1 (100%)	-
Corned	1	1 (100%)	-
Cotton candy	2	1 (50%)	1 (50%)

TABLE V. RHODAMINE B POSITIVE FOODS

Regarding the additive substance metanil yellow, it was observed that food types such as terang bulan, corned, and instant drinks contained metanil yellow. In addition, of the 15 sauce samples tested, 2 samples (13.33%) were positive for metanil yellow (Table VI).

TABLE VI. METANIL YELLOW POSITIVE FOODS

Type of food	n	Positive n %	Negative n %
Terang bulan	2	2 (100)	-
Sauce	15	2 (13.33%)	13 (86.67%)
Corned	1	1 (100%)	-
Instant drinks	1	1 (100%)	_

Analysis of five jam samples revealed that two samples (40%) were positive for saccharin (Table VII). Table VIII shows the presence of cyclamate in each (100%) of the six food types of the total eight food types tested. This result was observed because only one sample for each of the six food types was tested for cyclamate.

TABLE VII. SACCHARIN POSITIVE FOODS

No	Type of food	n	Positive n %	Negative n %	
1.	Jam	5	2 (40%)	3 (60%)	

#### TABLE VIII. CYCLAMATE POSITIVE FOOD

No	Type of food	n	Positive n %	Negative n %
1.	Tea	2	1 (50%)	1
2.	Kinca	1	1 (100%)	-
3.	Instant drinks	3	2 (66.67%)	1 (33.33%)
4.	Kuah pempek	1	1 (100%)	-
5.	Jam	4	1 (25%)	3
6.	Ice cream "X" strawberry	1	1 (100%)	-
7.	Bolu kukus	1	1 (100%)	-
8.	Meizes	1	1 (100%)	-

Based on the distribution data of schools in the city, schools that were highly exposed to street foods containing hazardous substances were SD 8, SD 5, SD 6, SD 9, SD 12, and SD 18 (Table IX).

TABLE IX. DISTRIBUTION OF HAZARDOUS-SUBSTANCE-CONTAINING STREET FOODS AROUND THE SCHOOLS

School name	For mali n	Bo rax	Rho dami ne B	Metan il yello w	Sacc harin	Cycla mate	Total
ES 1	0	0	0	0	0	0	0
ES 2	0	0	0	0	0	1	1
ES 3	0	0	1	0	0	0	1
ES 4	0	0	2	0	0	0	2
ES 5	1	0	2	1	1	0	5
ES 6	1	1	1	2	0	0	5
ES 7	0	0	2	0	0	0	2
ES 8	4	2	2	0	0	1	9
ES 9	1	0	3	0	0	1	5
ES 10	0	0	2	0	0	0	2
ES 11	1	1	1	0	0	0	3
ES 12	1	0	2	0	0	1	4
ES 13	0	0	0	0	0	0	0
ES 14	0	1	0	0	0	1	2
ES 15	0	0	2	0	0	1	3
ES 16	1	0	0	1	0	0	2
ES 17	0	1	1	0	0	0	2
ES 18	0	0	5	0	0	0	5
ES 19	0	0	0	0	0	0	0
ES 20	0	2	2	0	0	0	4
ES 21	0	2	2	0	0	0	4
ES 22	0	0	1	2	0	1	4
ES 23	0	0	2	0	0	0	2
ES 24	0	0	2	0	0	1	3
ES 25	0	0	1	0	0	0	1
ES 26	0	0	1	0	0	0	1
ES 27	0	0	3	0	0	1	4
ES 28	0	0	0	1	0	0	1
ES 29	0	0	1	0	0	0	1
ES 30	0	0	0	0	0	0	0
ES 31	0	0	1	0	0	0	1
ES 32	0	1	1	0	1	1	4

\*ES = Elementary School

## B. Discussion

1) School description

Of the 32 schools targeted, four schools showed 0% exposure to hazardous substances in foods, implying that the street foods sold around the schools contained no hazardous substances such as formalin, borax, rhodamine B, metanil yellow, saccharin, and cyclamate. Three schools that were located near the city had a clean school

environment, comprising children from the upper middle class. Another school was located near the market and had children from the middle-income class.

2) Characteristics of street foods and hazardous substances

## a) Preservatives

Food safety issues, particularly those of street foods around the schools, have become a focus of the government of Indonesia. The government had issued regulations for the ban of the use of harmful or hazardous substances, such as the ban on the use of formalin and borax listed in the Regulatory of Health Minister No. 033 of 2012 as food additives. In the present study, 10 of the 93 samples tested for formalin were found to contain formalin. The types of food containing formalin were sausages, meatballs, tempura, gorengan, and sempolan. Gorengan was a new finding in this study because this food type is generally prepared without using preservatives, which indicates that the use of formalin in food become more varies. A study conducted by Paratmanitya et al showed that of the 98 samples of street foods tested, 25 samples (25.5%) tested positive for formaldehyde, which included meatballs, sausages, dumplings, tempura, and noodles [6].

Formalin acts as an antibacterial agent that can slow down the activity of bacteria in foods containing excessive protein; formalin reacts with the protein in food and makes the food last longer. High formalin content in the body can cause abdomen irritation, allergic and carcinogenic effects, changes in the function of cells/tissues, vomiting, and deaths due to circulatory failure [7].

In this study, 11 samples of the 69 food samples tested were found to be positive for borax. Foods containing borax included meatballs, tahu bakso, cilok, batagor, dumplings, and tempura. In other cities, vendors also add harmful substances as a mixture of borax in street foods. In Bantul, of the 98 samples of street foods tested, 15 samples (15.3%) were positive for borax. These foods included meatballs, meatball chips, tempura, noodles, tahu bakso, and kerupuk. Borax was reportedly used as a food preservative in some foods containing meat and dairy products. This is because borax is able to inhibit the growth of microorganisms, so that the food can stay fresh and last longer. Moreover, the addition of borax is believed to control the gelatinization of starch, as well as improve the color, texture, and taste of the food [8].

*b) Coloring agents* 

In the present study, of the 78 samples tested, 43 samples were positive for rhodamine B. The types of foods containing rhodamine B were seasoning powder, sausages, jams, instant drinks, nuggets, otak-otak, tempura, and ice cream "X" strawberry. In other areas also, there is an increase in the use of rhodamine B in street foods. Paratmanitya et al reported that street foods in Bantul such as jelly, es cendol, syrup, sauces, and ice purple contained rhodamine B [6].

The increasing use of rhodamine B in food products could be due to its inexpensiveness compared with the cost of permitted food dyes. Another reason could be the lack of knowledge among domestic industrial producers regarding which coloring agent is allowed for use in foods [9]. Prohibiting the use of rhodamine B was regulated by Joit Regulation of Ministry of Internal Affairs and Head of National Agency of Drug and Food Control No. 43 of 2013 and No. 2 of 2013 [10]. Rhodamine B could cause carcinogenic effects and increase lipid peroxidation as a sign of oxidative stress.

Of the 69 food samples tested, there were 7 positive samples containing metanil yellow. The types of food tested positive for metanil yellow included terang bulan, corned, sauces, and instant drinks. Prohibiting the use of metanil yellow was regulated by the Regulation of the Ministry of Health No.239/Men.Kes/Per/V/85. Metanil yellow was banned from use in foods because it could cause toxic effects in the body [11]. However, currently, metanil yellow is widely used as a yellow coloring agent in foods because it is relatively inexpensive with bright and flashy colors [12].

Metanil yellow accumulates in the liver and affects free radicals, which could cause oxidative stress resulting in damage to the liver cells. Metanil yellow also has neurotoxic effects and causes lipid peroxidation, which indicates that metanil yellow affects the integrity of the cell membrane resulting in damage to the liver cells [13].

c) Sweeteners

Of the 25 samples tested for saccharin, there were 2 positive samples containing saccharin, which included jams. Like other harmful substances, saccharin was also found in street foods in other areas. In a school in Pekalongan, saccharin was found in street foods such as es cendol, chocolate wafers, and powder drink flavors. The use of saccharin in street foods was as much as 0.0005-1.3295 mg per serving. Saccharin is an artificial sweetener that has been widely used in foods and beverages without the extra calories. In addition, the sweetness level of saccharin is 300 times more than that of regular sugar. Saccharin is considered safe for consumption by the FDA (Food and Drug Administration) since it is not biologically absorbed or metabolized [14]. It is excreted through the kidneys without any abnormalities. The amount of saccharin that can be used in foods as recommended by the ADI (Acceptable Dietary Intake) is 0.5 mg/kg [15]. The maximum limit of the use of saccharin in foods is regulated by the government as listed in the National Agency of Drug and Food Control Chief Regulation No. 4 of 2014 about Maximum Limit Use of Sweetners Food Additives. The maximum limit of saccharin is 200 mg/kg in food items such as jams, jellies, and marmalades; 120 mg/kg in different types of drinking water-based flavors, not carbonated, including punches; and 300 mg/kg in other sugars and syrups (e.g., xylose, maple syrup, and confectionery sugar), types of table syrups (e.g., maple syrup), syrups used in bakery products and ice ornament (caramel syrup, flavored syrups), and sugar for cake decoration (e.g., colored sugar crystals for cookies) [16].

Regarding cyclamate, of the 25 food samples tested, 9 samples were positive for cyclamate. Another study reported that cyclamate was found in instant beverages sold in schools. In addition, cyclamate was found in foods such as cracker snacks, biscuits, chocolate wafers, and powder drink flavors. Cyclamate has a negative effect on health if it is continuously consumed for a long time. Takayama et al showed that cyclamate has carcinogenic effects that can lead to malignant cancer cells [17]. Cyclamate use has been prohibited by the National Agency of Drug and Food Control as an artificial sweetener in foods since 2014. However, traders still often use cyclamate in foods because of its high sweet taste (30–50 times sweeter than cane sugar), which could save the cost for sugar as a natural sweetener [18].

The maximum limit of the use of cyclamate was regulated by National Agency of Drug and Food Control No. 4 of 2014 about Food Additives. The maximum limit of cyclamate is 1000 mg/kg in food items such as jams, jellies, and marmalades; 500 mg/kg in food confectioneries/sweets, including confectionery/hard and soft candy and nougat; and 500 mg/kg in other sugars and syrups (e.g., xylose, maple syrup, and sugar ornamental), types of table syrups (e.g., maple syrup), syrups used for decoration of products in bakery and ice products (syrups, caramel, flavored syrups), and sugars used for cake decoration (e.g., colored sugar crystals for cookies)[16].

## 3) Analysis of food producers

The types of street foods sold around the schools can be grouped into self-produced foods made by home industries and foods derived from medium-scale industries. Foods analyzed in this study that could be homemade were batagor, dumplings, sempolan, terang bulan, meatballs, cilok, and tempura. Seasoning powder, sauces, jams, and instant drinks were produced by a medium scale industry (the processed plant). Most of the jams and sauces did not have indications of codes, labels, brands, types, composition, or other data associated with that product.

The addition of hazardous substances; preservatives such as formalin and borax commonly applied by food traders directly to the food. which was sold while the additional material, such as seasoning powder, sauce, butter were added to the main food sold, produced by medium scale industries, and street vendors only use the product. Food producers usually mixed the hazardous substances such as rhodamine B, metanil yellow, saccharin, and cyclamate into the product as an additional material. The reason for using harmful synthetic dyes in foods was that they were less expensive and produced more attractive colors compared with safe food dyes. Moreover, the addition of sweeteners was also aimed at reducing production costs.

The government has been implementing food safety programs in all industries, including household industries. Unfortunately, these sectors have the highest risk for malpracticing food quality and safety standards. These producers contribute approximately >20% to the total national food consumption, and, especially in urban areas, they could be considered as important contributors to the food supply chains for adults and children [19]. Food adulteration is an unethical business practice. It may occur at any time or any layer along the entire supply chain of the food, from the producer to the consumer and from "Farm to Fork." Any food or food product may reach from the farmer or its producer by the following methods:

- Directly to the hands of the consumers or
- First to retailers and then to consumers or
- First to wholesalers, then to retailers, and at last to consumers or
- First to local agents or brokers, then to manufacturers, later on to wholesalers, then to retailers, and at last to consumers, etc.

Therefore, food adulteration may occur in any of the layers or steps in the process of reaching the food from the farm or production to the fork of the consumers, as shown above. Any one or several of the farmers/producers, retailers, wholesalers, manufacturers, agents/brokers may cause the adulteration of food in a way of adding an adulterant, removing or reducing and substituting any element thereto, or false representation of any item as food with the intention of malice of extra profit-making [20].

Trading system settings do not guarantee the safety of hazardous substances in the market because the distribution of hazardous substances is indicated at approximately 3%–4% of the production of hazardous substances (formalin) into the consumer market, especially small-scale food industries. Leakage of formalin into the consumer market can be triggered by several factors such as utilization of excess production, the uncertainty in the cost of storage business in the small business sector (SME), and weak supervision, in addition to illegal trafficking of hazardous substances due to businesses having problems in obtaining a business license [21].

## IV. CONCLUSIONS

The percentage of street foods containing preservatives (formalin and borax), coloring agents (rhodamine B and metanil yellow), and sweeteners (cyclamate and saccharin) is high. The types of foods containing preservatives identified in this study included meatballs and tempura, while those containing coloring agents included spices, jams, and sauces. Sweetener-containing food types were instant drinks and jams. Hence, it is necessary to control the production and sales of street foods, especially foods that are often found to contain harmful chemicals, to prevent food adulteration. Adulteration of food may occur at any time or any layer along the entire supply chain of the food, from the producer to the consumer.

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#### REFERENCES

- Ministry of Health Republic of Indonesia (Kemenkes RI). Schoolchildren Street Food, Jakarta: Jejaring Informasi Pangan dan Gizi; 2011.
- [2] Directorate of Nutrition. Guidelines for Safety Food in Primary School, Jakarta: General Directorate of Maternal and Child Nutrition Ministry of Health Republic of Indonesia, 2011, pp. 1-76.
- [3] Y. Syafitri, H. Syarief, and Y. F. Baliwati, "Snacking habits among elementary school student, case study in SDN lawanggintung 01 Bogor," *Jurnal Gizi dan Pangan.*, vol. 4, no. 3, pp. 167-75, 2009.
- [4] F. A. Karimah, S. Sirajuddin, and Zakaria, "Analysis of synthetic dyes substances in food snacks primary school lariangbangi makassar," in Nutrition College PHF, University of Hasanuddin, editor, 2014, pp. 1-8.
- [5] National Agency of Drug and Food Control Republic of Indonesia (BPOM RI). Schoolchlidren Street Food, Jakarta: National Agency of Drug and Food Control Republic of Indonesia (BPOM RI), 2009.
- [6] Y. Paratmanitya and V. Aprilia, "Harmful food additive substances content in the snack food of elementary school children in Bantul," *Jurnal Gizi dan Dietetik Indonesia*, vol. 4, pp. 49-56, 2016.
- [7] I. Iftriani, S. Wahyuni, and H. Amin, "Formalin analysis in tofu in tradisional market in kendari," *Jurnal Sains dan Teknologi Pangan*, vol. 1, p. 129, 2016.
- [8] A. S. See, A. B. Salleh, F. A. Bakar, N. A. Yusof, A. S. Abdulamir, and L. Y. Heng, "Risk and health effect of boric acid," *American Journal of Applied Sciences*, vol. 7, no. 5, pp. 620-7, 2010.
- [9] J. Silalahi and F. Rahman, "Analysis of rhodamine B in schoolchildren street food in labuhan batu regency, North Sumatra," *Jurnal Indonesia Medical Association*, vol. 61, pp. 293-298, 2011.
- [10] Monitoring of Hazardous Substances That are Misused in Food, 2013.
- [11] Food Additives, 33, 2012.
- [12] W. Cahyadi, Analysis and Health Aspect of Food Additives, Jakarta: Bumi Aksara; 2008.
- [13] S. Hazra, R. Dome, S. Ghosh, and D. Ghosh, "Protective effect of methanolic leaves extract of coriandrum sativum against metanil yellow induced lipid peroxidation in goat liver: An in vitro study," *International Journal of Pharmacology and Pharmaceutical Science*, vol. 3, no. 5, p. 41, 2016.
- [14] US Food and Drug Administration. Additional Information About High Intensity Sweeteners Permitted for Use in Food in the United States United States: US Department of Health and Human Services. (2015). [Online]. Available: https://www.fda.gov/food/ingredientspackaginglabeling/foodadditi vesingredients/ucm397725.htm
- [15] C. R. Whitehouse, J. Boullata, and L. A. McCauley, "The potential toxicity of artificial sweeteners," *American Association* of Occupational Health Nurse, vol. 56, no. 6, pp. 251-259, 2008.
- [16] Maximum Limit Use of Sweeteners Food Additives, 4, 2014.
- [17] S. Takayama, G. Renwick, S. L. Johansson, U. P. Thorgeirsson, M. Tsutsumi, and S. M. Sieber, "Long term toxicity and carcinogenicity study of cyclamate in nonhuman primates," *Toxicol Science*, vol. 53, pp. 33-39, 2000.
- [18] J. Smith and L. Hs, *Food Additives Data Book*, United States: John Wiley & Sons, 2008.
- [19] J. Puspa and P. Kuhl, "Food quality and safety measures and controls: The future challenge for Indonesia," International Agricultural Research for Development, University of Kassel-Witzenhausen and University of Gottingen2007.
- [20] M. M. Sobhani, Food Adulteration: The Bangladesh Paradox, Law Journal Bangladesh. 2015, no. 2.
- [21] Ministry of Trade, *Distribution Control Analysis of Hazardous Substances*, Jakarta: Ministry of Trade, 2013.



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