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Factors Related to Schoold Food Snacks (SFS) Safety Through the Test of Borax, Formalin, and Escherichia Coli Bacteria

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Article Info	Abstract
	Food safety of primary school children snack is a source of health problems that must be considered. In 2010, BPOM reported 141 cases of food poisoning caused by School Food Snacks (SFS) with 79% occurred at the primary school level. The purpose of this research is to analyze factors related to food safety of school children in elementary school in Salatiga city. Type of observational analytic research using cross sectional design. The sampling technique used is the total sampling number of 35 respondents based on the inclusion and exclusion criteria. The research instrument using aquestionaire and examination of food samples of meatballs. Analysis using chi square. The results showed that sellers' knowledge, pedagogical education and hygiene of food snacks were factors related to School Food Snacks (SFS)safety through the test of borax, formalin and eschercia coli bacteria at Salatiga primary school (p <0.05). The selling age and duration of selling are not factors related to School Food Snacks (SFS) safety through the test of borax, formalin and eschercia coli bacteria at Salatiga Elementary School (p> 0,05). Suggestions that can be recommended by researchers is the need to improve the policy, planning and the role of Education Office and Public Health Service in improving food safety of snack in Salatiga primary school.

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INTORDUCTION

Children healthy is very important to be concerned because the primary age is the growth period which needs some important nutrition and food safety that is consumed in the school(The Ministry of Health of Indonesia, 2015).School Food Snacks (SFS) generally known as junk food that is founded in school environtment and mostly consumed regularly by students (The Ministry of Health of Indonesia, 2011).The level of student nutrition knowledge of SFS is quite high, but it doesn't underlie in chosing the proper SFS for them. It can be caused by availability limitations of the proper SFS in school environtment (Tanziha dan Prasojo, 2012) .

In 2008, it showed about 98,9% students who bought snack on their school and only 1% who didn't do it (The Ministry of Health of Indonesia, 2015).In 2010, there were 141 Extraordinary Cases (EC) about food poisoning. The 15% of 141 cases were caused by School Food Snacks (SFS) with the highest case was 69% to 79% happened on primary school level. Food poisoning can be caused by the high level of student SFS consumtion which is not followed by the application of How to Produce Good Food (HPGF) by the food sellers (BPOM RI, 2011).

The low level of SFS safety is being an important matter, in 2014 there was percentage decrease of SFS that full the qualification in Indonesia (76,18%), that is 90% of General Working Indicator (GWI) (The Ministry of Health of Indonesia, 2015). SFS that is not full the qualification in Indonesia in 2014 was caused by microbial contamination of 74.9%, dangerous ingredient used of 9.0%,and excessive used of Additional Food Ingredients (AFI) of 15.7%. (The Ministry of Health of Indonesia, 2015).

Based on the data of health profil Indonesia in 2014,Central Java occupied the percentage of food processing place that meet health requirements of 71.42 %,and it doesn't full the target of Strategic Plan (SP) in 2014 of 75% (Department of Health of Indonesia, 2015).

Based on the data of health profile Salatiga in 2014, the supervisory facilities for food management includes catering services,restaurant, snacks and water depots,the Place of Food Management (PFM) is eligible for 84.55%. Meanwhile, the PFM which is not eligible yet is 15.45% and which is tested in quotation is 17.10 % (Department of Health of Salatiga, 2015).

In relation to the above, the authors want to know what factors related to School Food Snacks (SFS) safety through the test of borax, formalin and Bacteria Escherichia coli in Salatiga primary school. The purpose of this research is to know the seller's knowledge, age, duration of selling, education and hygiene of food sanitation.

Benefits in this study to provide information on factors related to food safety, providing input and consideration in improving the safety of snack foods through the test of borax, formalin and Bacteria Escherichia coli in Salatiga primary school.

METHODS

This research is an analytical observational research with cross sectional design. The population are PJAS sellers who sell meatball on the primary school environment at Salatiga. Sample were chosen based on inclusion and exclusion criteria using total sampling as the sampling technique. The sample were 35 respondents. The research variable includes seller's knowledge, educational background, age, duration of selling, and food sanitation hygiene through the test of borax, formalin, and Escherichia coli bacteria. For the research instrument, the questionnaire and laboratory test of meatball sample which sold by respondents were used.

This research was conducted on October 2017. The data was obtained due to result of questionnaire and laboratory test of snacks sample. The data analysis was completed using chi square as the statictical test.

RESULT AND DISCUSSION

This research has purpose to analyze factors relates to SFS safety through the test of borax, formalin, and Eschercia colibacteria on primary school level at Salatiga. The result of this research will be explained as follows:

Seller's Knowledge

According to Table 1, it can be known that the test result of meatball sample sold by 10 respondents with less knowledge is positifely containing Escherichia coli bacteria (100%), while the test result of meatball sample sold by 22 of 25 respondents with sufficientknowledge is negatively containing Escherichia Colibacteria (88.0%). From the result, it is obtained the p-value 0.000. Because of the p-value = 0.000 < α (0.05), it is concluded that there is correlation between seller's knowledge and SFS safety through escherichia coli bacteria test.

This research also shows that the meatball sample test result sold by 8 of 10 respondents with less knowledge is positively containing borax (80.0%), while the meat ball sample test of 25 respondents with sufficient knowledge have negative result of borax (100%). From the result, it is obtained the p-value 0.000. Because of the p-value = 0.000 < α (0.05), it is concluded that there is correlation between seller's knowledge and SFS safety through borax test.

There are 5 respondents with less knowledge have negative result of formalin (50.0%) and 5 respondents with positive result of formalin (50.0%), meanwhile there are 24 of 25 respondents with sufficient knowledge have negative result of formalin (96.0%). From the result, it is obtained the p-value 0.000. Because of the p-value = 0.004 < α (0.05), it is concluded that there is correlation between seller's knowledge and SFS safety through formalin test.

Table 1. The correlation between seller's knowledge and SFS safety through borax, formalin, and Escherichia colitest

Knowledge		School Food Snacks (SFS) Safety Through the Test of Borax, Formalin, and Escherichia Coli Bacteria				Total		P-value
		Negative		Positive				
		F	%	F	%	F	%	
Knowledge of Escherichia Coli bacteria	Less	0	22.9	10	100	10	100	0.000
	Suffi-cient + Good	22	88.0	3	12.0	25	100	
Knowledge of borax test	Less	2	20.0	8	80.0	10	100	0.000
	Suffi-cien + Good	25	100	0	0	25	100	
Knowledge of formalin test	Less	5	50.0	5	50.0	10	100	0.004
	Suffi-cient + Good	24	96.0	1	4.0	25	100	

According to Notoatmodjo (2003) knowledge is the result of knowing, and this is happened after people do sensing of a particular object. Sensing happened through human senses, which are sense of sight, hearing, smelling, taste, and touch. In this research, there are 37.1% respondents who have elementary background education. Adolescence is the process of growing up. Wawan and Dewi (2010)reveal that knowledge is influenced by internal factors such as education which is needed to gain information such as things that support health so as to improve the quality of life. Interm of age there are respondents in the final teen category of 28.6%. Based on the data above, the cognitive teenagers are developing and not perfect yet, therefore some of them have less knowledge. According to Hurlock in Wawan and Dewi (2010) the more age, the maturity and strength of a person will be more mature in thinking and working.

Factors affecting people' level of knowledge are internal factors such as age, gender and intelligence; also external factors including education, exposure to mass media, economics, social relations and experiences (Soekamto, 2007). Seller who has knowledge of food additive will tend to have a positive attitude(the tendency to avoid the dangerous use of additional food additive).

Seller's Education Background

According to Table 2, it can be known that 9 of 13 respondents with elementary education have positive result of meatball sample test containing Escherichia Colibacteria (69.2%), while the 18 of 22 respondents with sufficient education have negative result of Escherichia Colibacteria in their meatball sample test (81.8%). From the result, it is obtained the p-value 0.004. Because of the p-value = 0.004 < α (0,05), it can be concluded that there is correlation between seller's education background and SFS safety through escherichia coli bacteria test.

The result also shows that 7 of 13 respondents with elementary education have positive result of meatball sample test containing borax (53.8%), while the 21 of 22 respondents with sufficient education have negative result of borax in their meatball sample test (95.5%). From the result, it is obtained the p-value 0.002. Because of the p-value = 0.002 < α (0.05), it can be concluded that there is correlation between seller's education background and SFS safety through borax test.

There are 8 of 13 respondentswith elementary education who have negative result of formalin in their meatball sample test (61,5%), while there are 21 of 22 respondentswith sufficient education have negative result of formalin in their meatball sample test (95.5%). Form the result, it is obtained the p-value 0,019. Because of the p-value = 0.019 < α (0.05), it can be concluded that there is correlation between seller's education background and SFS safety through formalin test.

Table 2. The correlation between seller and SFS safety through the test of borax, formalin, and Escherichia colibacteria

Education		School Food Snacks (SFS) Safety Through the Test of Borax, Formalin and Escherichia Coli Bacteria				Total		P-value
		Negative		Positive				
		F	%	F	%	F	%	
Education and Escherichia Coli Bacteria test	Elementary	4	30.8	9	69.2	13	100	0.004
	Sufficient education	18	81.8	4	18.2	22	100	
Education and borax test	Elementary	6	46.2	7	53.8	13	100	0.002
	Sufficient education	21	95.5	1	4.5	22	100	
Education and formalin test	Elementari	8	61.5	5	38.5	13	100	0.019
	Sufficient education	21	95.5	1	4.5	22	100	

Mahfoedz and Suryani (2009)state that education is an attempt to provide knowledge in order to increase the positive behavior. The high level education of a person will make them easier in receiving information and more knowledge they will have. Nevertheless this is less compatible with previous research conducted by Damayanthi *et al.*, (2013)that indicated the characteristics of School Food Snacks Seller (SFSS) in elementary school at Bogor according to educational level got half of result was elementary level (46.9%), but there are also from Diploma and Strata 1 level (2.5%). The research result of Nasikin, Wariyah dan Hartati (2013)showed that there was a significant correlation between education level and knowledge of food safety with food sanitation hygiene.

Seller's Age

According to Table 3, it can be known that 6 of 10 respondents in age 17-25 years old have negative result of Escherichia Colibacteria in their meatball sample test (60.0%), while 16 of 25 respondents in age 26-45 years old and 46-65 years old also have negative result of Escherichia Colibacteria in their meatball sample test (64.0%). The result of analysis is p-value 1.000. Because of the p-value = 1.000 > α (0.05), it is concluded that there is no correlation between seller's age and SFS safety through Escherichia coli bacteria test.

Table 3. the correlation between seller's age and SFS safety through the test of borax, formalin and Escherichia colibacteria

Seller's age		School Food Snacks (SFS) Safety Through the Test of Borax, Formalin an Escherichia Coli Bacteria				Total		P-value
		Negative		Positive				
		F	%	F	%	F	%	
Seller's age and Escherichia Coli bacteria test	17-25 years old	6	60.0	4	40.0	10	100	1.000
	26-45 and 46-65 years old	16	64.0	9	36.0	25	100	
Seller's age and borax test	17-25 years old	7	70.0	3	30.0	10	100	0.661
	26-45 and 46-65 years old	20	80.0	5	20.0	25	100	
Seller's age and formalin test	17-25 years old	8	80.0	2	20.0	10	100	1.000
	26-45 and 46-65 years old	21	84.0	4	16.0	25	100	

This research also shows that 7 of 10 respondents in age 17-25 years old have negative result of borax in their meatball sample (70,0%), while 20 of 25 respondentsin age 26-45 years old and 46-65 years old have negative result of borax in their meatball sample (80.0%). The analysis result is p-value 0.661. Because of the p-value = 0.661 > α (0.05), it is concluded that there is no correlation between seller's age and SFS safety through borax tets.

There are 8 of 10 respondents in age 17-25 years old have negative result of formalin in their meatball sample test (80.0%), while 21 of 25 respondents in age26-45 years old and 46-65 years old also have negative result of formalin in their meatball sample test (84.0%). The result of analysis is p-value 1,000.Because of the p-value = 1.000 > α (0,05), it is concluded that there is no correlation between seller's age and SFS safety through formalin test.

Notoatmodjo (2003) stated thatage is one of factors that influence the knowledge formation, the older of someone age the more constructive they use coping in any problems they are encountered. Azwar (2003)said that age is a factor that can describe a person's maturity whether in psychically, physically, and socially.

Duration of Selling

According to Table 4, it can be known that 13 of 20 respondents with duration of selling < 1 year and 1-5 years have negative result of Escherichia Colibacteria in their meatball sample test (65.0%), and 9 of 15 respondentswith duration of selling 5-10 years and > 10 years also have negative result of Escherichia Colibacteria in their meatball sample test (60.0%). The result of analysis is p-value 1.000. Because of p-value = 1.000 > α (0.05), it is concluded that there is no correlation between duration of selling and SFS safety through Escherichia coli bacteria test.

This research also shows that 16 of 20 respondents with duration of selling< 1 year and 1-5 years have positive result of borax in their meatball sample test (80.0%), meanwhile 11 of 15 respondents with duration of selling 5-10 years and > 10 years have negative result of borax in their meatball sample test (73.3%). As the result, it is obtained the p-value 0,700. Because of the p-value = 0.700 > α (0.05), it is concluded that there is no correlation between duration of selling and SFS safety through borax test.

Table 4. The correlation between duration of selling and SFS safety through the test of borax, formalin and Escherichia colibacteria

Duration of selling		School Food Snacks (SFS) Safety Through the Test of Borax, Formalin an Escherichia Coli Bacteria				Total		P-value
		Negative		Positive				
		F	%	f	%	F	%	
Duration of selling and Escherichia Coli bacteria test	< 1 year and 1-5 years	13	65.0	7	35.0	20	100	1.000
	5-10 years and > 10 years	9	60.0	6	40.0	15	100	
Duration of selling and borax test	< 1 year and 1-5 years	16	80.0	4	20.0	20	100	0.700
	5-10 years and > 10 years	11	73.3	4	26.7	15	100	
Duration of selling and formalin test	< 1 year and 1-5 tahun	18	90.0	2	10,0	20	100	0.367
	5-10 years and > 10 years	11	73.3	4	26.7	15	100	

There are 18 of 20 respondentswith duration of selling < 1 year and 1-5 years have negative result of formalin in their meatball sample test (90,0%), also the 11 of 15 respondents with duration of selling 5-10 years and > 10 years have negative result of formalin in their meatball sample test (73.3%). The result of analysis is p-value 0.367. Because of the p-value = 0.367 > α (0.05), it is concluded that there isi no correlation between duration of selling and SFS safety through formalin test.

Mubarak (2007)assumed that someone who has worked for long time will gain experience and knowledge both directly and indirectly. This results of study are not accordance with previous studies by Damayanthi *et al.* (2013)which the result was the duration of selling correlated with knowledge, attitudes, and practices of food selling about nutrition and food safety. This was occurred because there were other factors correlated with SFS safety through the tes of borax, formalin, and Escherichia coli bacteria according to seller's knowledge and food hygiene. Previous research by Syah *et al.* (2015)showed that the main problem of food safety is the problem of microbiological contamination due to poor sanitation and hygiene in the production process and the preparation of SFS, and chemical contamination problems due to the misuse of hazardous chemicals on food.

Food Sanitation Hygiene

According to Table 5, it can be known that 12 of 16 respondents with poor food sanitation hygienehave positive result of Escherichia Colibacteria in their meatball sample test (75.0%), then 18 of 19 respondentswith good food sanitation hygiene have negative result of Escherichia Colibacteria in their meatball sample test (94.7%). The result of analysis is p-value 0,0001. Due to the p-value = 0.0001 < α (0.05), it is concluded that there is correlation between food sanitation hygiene and SFS safety through escherichia coli bacteria test.

This research also shows that 9 of 16 respondentswith poor food sanitation hygiene have negative result of borax in their meatball sample test (56.2%), then 18 of 19 respondents with good food sanitation hygiene also have negative result of borax in their meatball sample test (94.7%). As the research result, it is obtained the p-value 0.013. Due to the p-value = 0.013 < α (0.05), it is concluded that there is correlation between food sanitation hygiene and SFS safety through borax test.

Table 5. the correlation between food sanitation hygiene and SFS safety through the test of borax, formalin, and Escherichia colibacteria

Food sanitation hygiene		School Food Snacks (SFS) Safety Through thr Teat of Borax, Formalin andEscherichia Coli Bacteria				Total		P-value
		Negative		Positive				
		F	%	F	%	F	%	
Food sanitation hygiene and Escherichia Coli bacteria test	Poor	4	25.0	12	75.0	16	100	0.0001
	Good	18	94.7	1	5.3	19	100	
Food sanitation hygiene and borax test	Poor	9	56.2	7	43.8	16	100	0.013
	Good	18	94.7	1	5.3	19	100	
Food sanitation hygiene and formalin test	Poor	10	62.5	6	37,5	16	100	0.005
	Good	19	100	0	0	19	100	

There are 10 of 16 respondentswith poor food sanitation hygiene have negative result of formalin in their meatball sample test (62.5%), and 19 respondentswith good food sanitation hygiene have negative result of formalin in their meatball sample test (100%). The result of analysis is p-value 0.005. Because of the p-value $= 0.005 < α$ (0.05), it can be concluded that there is correlation between food sanitation hygiene and SFS safety through formalin test.

Food sanitation hygiene is very important because the wrong handling of hygiene can cause respiratory infections, digestive and skin diseases (Purnawijayanti, 2001). The previous research conducted by Syah *et al.* (2015)showed that the main problem of food safety is the microbiological contamination problem due to poor sanitation hygiene of production process and preparation of SFS and chemical contamination problems due to the misuse of hazardous chemicals on food.

This research is supported by another research that was conducted Setyorini (2013)against the hygine practice of seller in the presence of Escherchia colibacteria which concluded that there was relationship between hygine practice of seller with the presence of Escherchia colibacteria in *rujak*that was sold around campus of *Universitas Negeri Semarang*. The research that was conducted by Ningsih (2014)indicated that the sanitation facilities around selling place are mostly eligible. Other studies have shown that food presentation, sanitation facilities, and handling personnel correlated with Escercia colibacteria contamination (Kurniadi, Saam dan Afandi, 2013)

CONCLUSION

Based on the results of research and discussion it can be concluded that the knowledge of sellers, peddler education and hygiene sanitation food snack is a factor related to School Food Snacks (SFS) safety through the test of borax, formalin and eschercia coli bacteria in Salatiga primary school ($p < 0.05$). The selling age and duration of selling are not factors related to School Food Snacks (SFS) safety through the test of borax, formalin and eschercia coli bacteria in Salatiga primary school ($p > 0.05$).

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