LEMBAR HASIL PENILAIAN
SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : PROSIDING

Judul Karya Ilmiah (Paper)	:	Identification of Microbial Contaminants (E. Coli, Salmonella and Listeria) on Bulk and packaged of Banana Chips From Home Industry Product.
Jumlah Penulis	:	1 Orang
Penulis Makalah/ Poster	:	**Dewi Sartika**
Status Penulis	:	**Penulis Mandiri** / Penulis ke Tiga / Penulis Korespondensi **)
Identitas Prosiding	a. Judul Prosiding :	Proceeding UNJ ICTVET 2015 2nd UNJ International Conference on Technical and Vocational Education and Training
	b. Judul Prosiding :	ISBN : 978-602-1619-01-8
	c. Tgl/Bln/Tahun :	Universitas Negeri Jakarta Oktober 2015
	d. Tempat Pelaksanaan :	Jakarta
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b. Kedalaman Kajian (40%) (Melakukan analisis, eksplorasi, dan elaborasi terhadap masalah yang dibahas berdasarkan kaidah-kaidah ilmiah yang berlaku dalam penelitian dan pengkajian; mengandung kebenaran ilmiah, ketuntasan kajian, kesistematisan pembahasan, dan didukung dengan pustaka yang relevan)	6	4	4	2	5
c. Kebermanfaatan (10%) (Memberikan manfaat bagi kemajuan ilmu dan solusi bagi masalah yang dihadapi masyarakat)	1.5	1	1	0.5	1,3
d. Relevansi karya dengan keahlian (20%) (Memiliki keselarasan antara karya ilmiah dengan penelitian magister/ doktor dan bidang penugasannya)	3	2	2	1	3
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UNJ ICTVET 2015

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"TVET in The Changing World of Work"

October 27th, 2015
Universitas Negeri Jakarta, Indonesia

Organized by :
Faculty of Engineering
Universitas Negeri Jakarta
Indonesia

ISBN : 978-602-1619-01-8

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LEMBAR PENGESAHAN

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Publikasi	: Proceeding UNJ ICTVET 2015 2 nd UNJ International Conference on Technical and Vocational Education and Training
No. ISBN	: 978-602-1619-01-8
Edisi	: 27 Oktober 2015, Universitas Negeri Jakarta
Website	:

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IDENTIFICATION OF MICROBIAL CONTAMINANTS (E. Coli, Salmonella, and Listeria) ON BULK AND PACKAGED OF BANANA CHIPS FROM HOME INDUSTRY PRODUCT

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University of Lampung

ABSTRACT

Banana chips are fried products. In Lampung, banana chips is a very popular food and It becomes a souvenir food from Lampung. In Lampung, banana chips was produced by home industry. In sales, banana chips was sold as a bulk and packaged. The prices are relatively inexpensive when bought in bulk form of banana chips. The bulk Banana chips was contaminated microbial easy. In this study, would be assessed that the level of of Salmonella, E. coli, and Listeria contamination on banana chips, either bulk or packaged product. The results showed that the packaging treatment was found could inhibit the cross-contamination by Salmonella, E. coli and Listeria compared than no packing /bulk. The bulk Banana chips was detected 33.33% was contaminated by Salmonella 68 ± 3 to 88 ± 1 cfu and E. coli 47 ± 1 to 66 ± 2 cfu. So, The bananas chips packaged more safety than bulk/unpackaged.

***Key-word**: contaminants, microbes, banana, chips, industry*

I. Introduction

The Banana Chips home industry are a centers of typical food souvenirs from Lampung. Bananas Chips Industrial Zone located in Bandar Lampung.

In the face of business development, the employer chips in Chips home Industry need a cooperation and a partnerships program to increase knowledge, skills and network, so, Chips home Industry be able to promote product in the other place.

Skills and knowledge in the production of chips, especially in the diversification of raw material products such as bananas, fruits, and cassava to produce various chips. Banana chips effort was not optimal, this was due to lack of knowledge and skills to organize the home industry of chips. Not implementation of appropriate technology yet, was a lack of product development. So, in sales, The chips mostly was sold on the bulk form, and not in the packaged form. In a bulk form, was susceptible to cross contamination by microbes eg, Salmonella, E. coli, and listeria, both of which are cause of unaseptic process and environment, such as, from the dust. It was a very dangerous product for consumers who consumed them.

In this study would examined the level of microbial contamination such as Salmonella, E. coli, and listeria in bulk and packaged banana chips. The benefits of this research is as a consideration for the chips seller in product selling.

II. METHODS

A. Time and Place

This study was conducted in August-September 2015 and the location of research was in the Laboratory Analysis of Results of Agriculture, Department of Agricultural Technology, University of Lampung.

B. Equipment and Materials

The used tool was a petri dish, a test tube, micropipette, bunzene, autoclave, incubator, hot plate, erlenmayer and mortar. The materials used are original flavor of banana chips products that have been packaged and bulk from home industry, Listeria selective medium, Media Buffer Peptone Water, Mac Conkey medium, XLD medium, and distilled water.

C. Methods

The research design was a complete randomized block design, with three replications. The procedure of research was conducted with the following procedures:

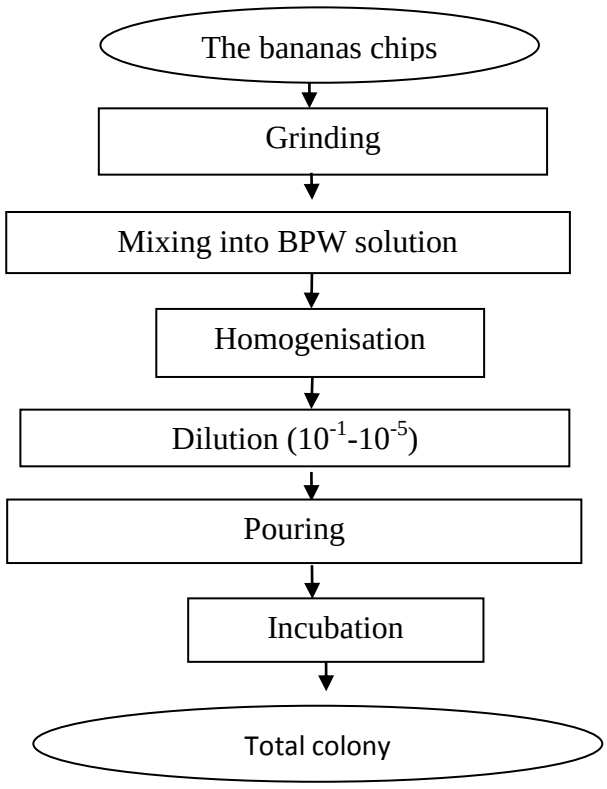

Figure 1. Research Procedure

D. Data Analysis

Data were analyzed descriptively.

III. RESULTS AND DISCUSSION

A. E.*coli* Contamination

Identification of E. *coli* contamination was done using by Mac Conkey media. Home industry that produce the bulk and packaged of banana chips were be coded A, B, C, D, E, F. E. *coli* contamination on the sample was presented at Table 1 below:

Table 1. E *coli* contamination on the samples at Home industry of banana chips

banana chips Sample	A	B	C	D	E	F
	(cfu)					
Bulk	66 ± 2	0	47 ± 1	0	0	0
packaged	0	0	0	0	0	0

The results showed that 33.33% of bulk chips was contaminated with E *coli* 47 ± 1 to 66 ± 2 cfu. The chips packaged tend more save from contamination of E. *coli* than un packaged (100% product of packaging chips was identified on Mac Conkey media did not show any E. *coli* colonies growing (Figure 2). E. *coli* does not grow shows that banana chips packaged more aseptic than the bulk form. According to Brennan (2006) contamination of E *coli* indicates that the product during processing was not unaseptic conditions. Colony Performances of E. *coli* on Mac Conkey media as a follows:

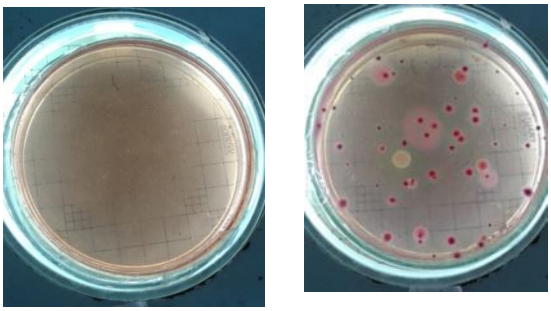

figure 2. Colony Performances of E. coli on Mac Conkey media with bulk and packaged of bananas chips treatment

B. Salmonela Contamination

Identification of Salmonella contamination was done using by XLD media. Home industry that produce the bulk and packaged of banana chips were be coded A, B, C, D, E, F.

Salmonella contamination on the sample was presented at Table 2 below:

Table 2. Salmonella contamination on the samples at Home industry of banana chips

banana chips Sample	A	B	C	D	E	F
	(cfu)					
Bulk	88 ± 1	0	0	68 ± 3	0	0
packaged	0	0	0	0	0	0

The results showed that 33.33% of bulk chips was contaminated with Salmonella 68 ± 3 to 88 ± 1 cfu. The chips packaged tend more save from contamination of Salmonella than unpackaged (100% product of packaging chips was identified on SSA media did not show any Salmonella colonies growing (Figure 3). Salmonella does not grow shows that banana chips packaged more aseptic than the bulk form. According to Bhunia (2008) Salmonella grows rapidly on medium high in protein. While packaging chips tend to be more secure Salmonella contamination than unpackaging. contamination of Salmonella indicates that the product during processing was not unaseptic conditions. Colony Performances of Salmonella on SSA media as a follows:

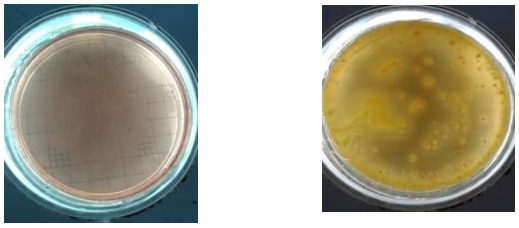

figure 3. Colony Performances of Salmonella on SSA media with treatment, such as, bulk and packaged

B. Listeria Contamination

Identification of listeria contamination was done using by listeria selective media. Home industry that produce the bulk and packaged of banana chips were be coded A, B, C, D, E, F. listeria contamination on the sample was presented at Table 3 below:

Table 3. Salmonella contamination on the samples at Home industry of banana chips

banana chips Sample	A	B	C	D	E	F
	(cfu)					
Bulk	0	0	0	0	0	0
packaged	0	0	0	0	0	0

The results showed that 0% of bulk chips was contaminated with Listeria. packaging chips Product that was identified on Listeria selective media did not show any Listeria colonies growing (Figure 4). Colony Performances of Listeria on Listeria selective media as a follows:

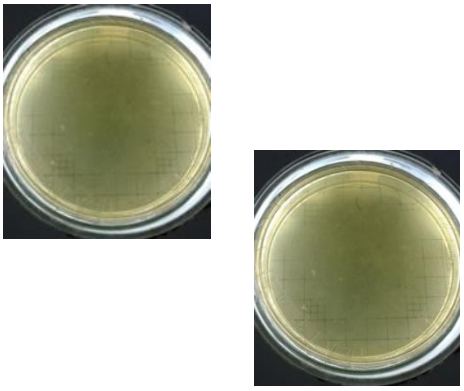

figure 4. Colony Performances of Listeria on Listeria selective media with treatment such, as bulk and packaged

D. organoleptic test of Banana chips

The use of Packaging is more preferable than unpackaging or bulk, it can be seen on all of banana chips: product, such as, natural (A), choco (B), and cheese (C). The influence of the packaged and unpackaged treatment on banana chips was shown on Table 4 and Figure 5 below:

Table 3. The Acceptance Level of bulk and packaged banana chips

Contact time	banana chips bulk/unpackaged			banana chips packaged		
	natural	choco	cheese	natural	brow	cheese

(day)					n	
1	4.5333 ns	4.5333 ns	4.6000 ns	4.6333	4.6000	4.4333
2	3.2333 **	3.2333 **	3.3333 **	4.5000	4.4333	4.3000
3	2.6333 **	2.5667 **	2.4333 **	4.2000	4.2000	4.1000
4	1.9333 **	1.8000 **	1.9333 **	3.6667	3.7667	3.7333

Description: The results of the t test □□ 99%; ns = not significant; ** = different significantly

On Table 3, shows that the increase of air contact influnced on banana chips aromatic. Based on organoleptic test, aromatic of unpackaged treatment lowers the level of preference aromatic of banana chips, from 4.5 (very like) to 1.9 (not like). This is in contrast with packaged banana chips only declining from 4.5 to 3.7 (still like). All of unpackaged /bulk chips, such as, A) natural banana chips; (B) chocolate banana chips; and (C) banana chips cheese was have bad of aroma, color, and overall acceptance . This phenomenon can be seen from the trend of decline in the level of preference in the following fgure:

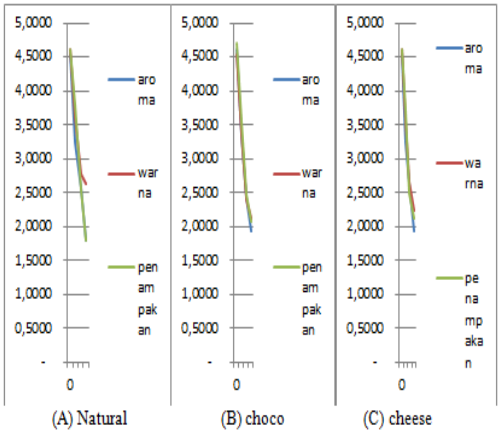

Figure 5. acceptance level of unpackaged bananas chips

IV. CONCLUSION

The conclusion from this research was the packaging treatment could inhibit the cross-contamination of Salmonella, E. coli and Listeria compared than unpackaging / bulk (33.33% was contaminated with Salmonella 68 ± 3 to 88 ± 1 cfu and 33.33% was contaminated with E coli 47 ± 1 to 66 ± 2 cfu. Based on aceptance level test, aromatic of unpackaged treatment lowers the level of aromatic preference on banana chips from 4.5 (very like) to 1.9 (not like). This is in contrast with banana chips that was packaged, the level of aromatic preference only declining to 3.7 scale (still favored/like).

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[1] Bhunia AK. 2008. Foodborne Microbial Phatogens. USA. Springer.

[2] Brennan JG. 2006. Food Processing Handbook. Germany. Wiley-VCH.