The Use Of Knob And Plat Tranducers For Developing Healthy Drink

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Abstract: The healthy drink usually contains a lot of chemical elements, without microbes inside. But the natural drink like the botanical drink is difference it contains chemical and biological elements. This study was aimed to develop healthy drink of Sugarcane juice by the use of different techniques, i.e.: Knob and Plate. It was an attempt to examine the different effects of Knob and Plate treatments on potential Hydrogen (pH). The old techniques that can be used to eliminate microbe elements from the botanical drink are: Warming, Pasteurization, Pickling, Screening, Irradiating Electromagnetic Wave, and Ozonizing. However, these techniques may cause changes in sense, color and acidity of botanical drink. Other techniques that can be used to sterilize all bacterium in botanical drink (especially sugarcane juice) include the ultrasonic (48 kHz, 5 Vpp, 5 Vdc) by radiating technic (12 knobs) and by front wave technic (Plate). The results of the present study indicate that fresh sugarcane after being irradiated by the 12 Knobs and stored in lab room for 2 days has pH value 5, and by the Plate treatment has pH value 6.5 (in 1.5 hours irradiated) or 8.5 (in 2.5 hours irradiated). This study of the ultrasonic irradiation by Plate transducer can be an effective technic to develop healthy drink with pH 8.5 which may be considered as ergogenic aids suitable to increase energy.

Key word: Sugarcane, Knob, Plate, Ultrasonic, pH.

INTRODUCTION

The progress research, science and technology very fast and progressively, sport sustainable development research, it produces some sport drinks, so this technology can boost Indonesian tradisional beverage manufacturer progress. Research and development are the discussion of research method in developing basic researches (especially for sugarcane juice[1)]. The researches with 12 Knobs and Plate ultrasonic transducer[2), 3)] can be done to make healthy drinks. We have some techniques of making of healthy water namely: 1. mixing of pure chemical element, 2. mixing of botany element. In the two technic have some difference of criteria, as in total bacteria, in making procedure (a. by simple and cheap, b. by thermal and cooler, c. by filter, d. by electromagnetic, e. by ozone), and it had been developed a new technic ultrasonic irradiation by 12 Knobs, and by Plate, that transducers implant[4)].

METHOD AND MATERIAL

This research is to develop healthy drink from botanical component and then getting good water for athlete performance. The base phenomenon of Knob or Plate transducer namely: 1. Did not changes heat mean while ultrasonic wave transmitted on media by transducer (Knob or, Plate)[2)]. 2. Have collisions between particles and microbes[3)], 3. Have collisions between microbes and microbes[2)], become broke colony bacteria, 4. Have cavitation causing anaerobic bacterium die[5)], 5. The sterilizing happens Bulk oils in open tube during 10 days[5)] and do not grow bacteria, this basic treatment can be develop to sugarcane juice. 6. This research could be a feasibility study about healthy drink with potential Hydrogen detection between without ultrasonic and with 12 knobs or Plate ultrasonic transducer in 48 kHz, 5 Vpp, 5 Vdc, during 1,5 – 3 hours[5)].

RESULT OF OBSERVATION

1. Treatment and observation-1

In first treatment of sugarcane juice's filtering with filter paper, filtration of sugarcane was not exposed by ultrasonic, and close tube with plastic, and incubated in room storage 1 – 2 days at 20^o – 28^o C and detected pH value per day. The degradation value occured from 5 to 3 (acid), those shows in table-1 and after one week storage the bacterium colony growth spreader on Petridis.

Table-1: *pH value in sugarcane juice without ultrasonic treatment*

Replica	Criteria	pH in fresh	pH incubate in 4–5 hours	pH in 2 day storage	pH in 3 days storage	pH in 5 days storage
1	Sugarcane-1 + no ultrasonic (tube close)	5.5	5.5	4	4	3
2	Sugarcane-2 + no ultrasonic (tube close)	5.5	5.5	4	-	3
Control	Sugarcane + no ultrasonic (tube open)	5.5	5.5	4	-	3

2. Observation-2 and treatment

In second observation of sugarcane juice in tube with exposed 12 Knobs transducer ultrasonic and close tube with plastic, in room storage (incubates) 1 - 2 days at 20^o – 28^o C and pH value detecting per days, there was had constant value of pH (= 5), and then continue value in acid, those show in table-2, and in one week after irradiated the bacterium colony growth spreader colony on Petridis.

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Table-2: *pH value in sugarcane juice with Knob transducer ultrasonic treatment*

Replica	Criteria	pH in fresh	pH incubate in 4–5 hours	pH in 2 day storage	pH in 3 days storage	pH in 5 days storage
1	Sugarcane-1 + Knob ultrasonic (tube close) at 3 hours	5	5	5	4,5	3
2	Sugarcane-2 + Knob ultrasonic (tube close) at 2,5 hours	5,5	5,5	5	-	3
3	Sugarcane-3 + Knob ultrasonic (tube close) at 1,5 hours	5,5	5,5	4,5	-	3

3. Observation-3 and treatment

In second observation of sugarcane juice in tube with exposed Plate transducer ultrasonic, and close tube with plastic, incubates 3 days at 20^o – 28^o C. and pH value detecting in room storage (20 – 28^o C) per day, The increase value of pH and decrease and then continue value in acid, those show in table-3, and in one week after irradiated the bacterial colony grew on Petridis

Table-2: *pH value in sugarcane juice with Plate transducer ultrasonic treatment*

replica	Criteria	pH in fresh	pH incubate in 4–5 hours	pH in 2 day storage	pH in 3 days storage	pH in 5 days storage
1	Sugarcane-2 + Plate ultrasonic (tube close) at 1,5 hours	5,5	6,5	4	-	3
2	Sugarcane-2 + Plate ultrasonic (tube close) at 2,5 hours	5,5	8,5	5	-	4

DISCUSSION

Result of this research shows difference values in pH and in colony bacteria, i.e.: A sugarcane juice without ultrasonic is became more acid, then a sugarcane juice with radiation by 12 knobs can be worth remain constant for some time and then to acid, but a sugarcane juice with irradiation (front wave) by Plate and to became alkalis, then to acid. Each sugarcane juice in one week storage after treatment has growing a lot colonies bacterium. Discussion of the phenomenon's showed:

1. Collusion of particle sugarcane and bacteria by using knob transducers give less strong than by using plate transducers give stronger. There are having correlation between bacteria aerobic and bacteria anaerobic growing inside tube.
2. Ultrasonic phenomena like as collision in sugarcane juice: Between particle and particle (solvent and dissolved), between particle and microbes (liquid and bacteria); and between microbe and microbe. Sonic development of theory mechanic can be approved radiation theory by Knob transducer and cavitation theory (front wave from Huygens) by Plate transducer.
3. Old research by Carmen JC[7], his study of ultrasonic (Plate) was applied particles (antibiotic) with microba[8] caused results showed a lot of died microbe.
4. This research (in concept) shows the same result as Syamsul Arifn[3] technic radiating ultrasonic by Knob transducer and cavitation effect by Plat transducer in Manihot utikissima (anaerobic bacteria), and Wisnu Istanto[5] technique in time irradiating (1,5 - 3 hours) in bulk oil. The treatment research with sugarcane juice were treated differently irradiating with Knob transducers and Plate transducers. In Knob transducer, after irradiating bacteria can statically grow so show pH of value was continue, because collision phenomena. Discuss in this phenomena: inactive bacteria turn to be small parts colony, so after irradiating bacteria grow slowly. With plate transducer, irradiating anaerobic bacteria in sugarcane juice (with close tube with plastic) did not show growth or death, because cavitation phenomena, that reaction can change water into oxygen, and then oxygen caused anaerobic bacteria to be inactive or die. So generally big parts of component of bacteria die is Carbon (and another: Hydrogen, Oxygen, Nitrogen, Sulfur, Phosphor) as good media for culturing, and showed pH value was increase by plate transducer ultrasonic and after one day storage, pH to decrease quickly, because liquid is more acid from biochemical components.
5. This research was applied in mice, before using for athlete as the alkalis sugarcane healthy drink by irradiated ultrasonic with Plate transducer.
6. Nutrition Compositions of healthy sugarcane drink are the alkalis intake and low bacteria, that good drink can be used athletic after activity per day.
7. We can see after exercise, blood presents increase lactate acid and decrease blood glucose[9], then drinking some sugarcane juice from plate irradiating can give better performance and energy athlete [10].

CONCLUSION

The conclusion of fresh sugarcane juice treatment after being irradiating by the 12 Knobs and stored in lab room for 2 days shows pH value 5, and by the Plate treatment showed pH value 6.5 (in 1.5 hours irradiated) or 8.5 (in 2.5 hours irradiated), so the ultrasonic irradiation by Plate transducer can be an effective technic for producing healthy drink with pH 8.5

PARTISIPATION

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REFERENCES

[1]. Syamsul Arifin, 2014, The Difference paper of pH (Hydrogen potential) indicator between medium: Sugarcane juice, Borassus flabellifer water and cow milk with knob and ultrasonic [A review], International Journal of Scientific & Technology Research, volume 3 – Issue 11, November 2014, Edition - ISSN 2277-8616, pp. 287 – 289.

[2]. Syamsul Arifin, Pestariati, and Wisnu Istanto, 2015, The Cavitation (With Plate Transducer) And Non Cavitation (With Knob Transducer) By Manihot utilissima Fermentation [The Potential Hydrogen (pH) Method], International Journal of Scientific & Technology Research (IJSTR), Vol. 4 – Issue 09, September 2015 Edition - ISSN 2277-8616, pp. 434 – 438.

[3]. Syamsul Arifin, Ni'mahtuzahroh, Soegianto, Retno Apsari, Suhariningsih, 2013. *Aquatic* Bacteria Of Pseudomonas aeruginosa Growth Model In Tube Ultrasonic, International Journal of Scientific & Technology Research (IJSTR), Volume 2 – Issue 8, August 2013 Edition - ISSN 2277-8616.

[4]. Tor Monsen, Elisabert Lovgrenm Micael Widerstrom and Lars Wallinder, 2009. In Vitro Effect of Ultrasonic on Bacteria and Suggest Protocol for Sonication and Diagnosis of Prosthetic Infection, University Hospital of Med Sweden, and Journal of Clinical Microbiology.

[5]. Wisnu Istanto, Syamsul Arifin[1)], Evy Diah Woelan Sari, Ocky Dwi Suprobowati, 2016. The effects of Ultrasonic application for the Microbiological quality of bulk cooking oil, International Journal of Scientific & Technology Research (IJSTR), Vol. 5 – Issue 06, Juni 2016 Edition - ISSN 2277-8616.

[6]. Raichel Daniel R, 2006. The Science and Applications of Acoustics, 2ND Ed, CUNY Graduate Center and School of Architecture, Urban Design and Landscape Design The City College of the City University of New York (E-Books), down load 02/2008.

[7]. Carmen JC, Nelson JL, Beckstead BL, Runyan CM, Robison RA, Schaalje GB, Pitt WG, March, 2006. Ultrasonic-enhanced Gentamicin transport through colony Biofilms of Pseudomonas aeruginosa and E.coli, Copyright© 1994-2010 by Medscape www.ncbi.nlm.gov/pmc/articles/pseudomonas+aeruginosa+-+ultrasonic.

[8]. Azusa Hirakawa, Shaw Watanabe and Shigeho Tanaka, 2015, Koda's Fasting Therapy: Energy Balance And Intestinal Bacterial Flora, Open Journal: Advances In Food Technology And Nutritional Sciences, http://dx.doi.org/ 10.17140/AFTNSOJ-1-120.

[9]. Mochamad Purnomo, 2011, Asam Laktat Dan Aktivitas Sod Eritrosit Pada Fase Pemulihan Setelah Latihan Submaksimal, Jurnal Media Ilmu Keolahragaan Indonesia, Volume 1. Edisi 2. Desember 2011, ISSN: 2088-6802, http://journal.unnes.ac.id/index. php/miki .

[10]. Haryo Tilarso, article: ERGOGENIC AIDS, BKOM Stadion Senayan Jakarta