Proceeding

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Good oral health for brighter smile

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CONTENT

The Difference Of Salivary Ph And Viscosity After Consuming White Rice (Oryza Sativa), Cilembu Sweet Potato (Ipomoea Batatas Cultivar Cilembu) And Purple Sweet Potato (Ipomoea batatas cultivar ayumurasaki)

Stefanus Christian[1], Sulistyani[1], Dwi Prijatmoko[1]

[1]Faculty of Dentistry Jember University
E-mail :gawat_76@yahoo.com

ABSTRACT

INTRODUCTION : Saliva is a liquid substance which is secreted by salivary glands and it plays a significant role in protecting the mucosa of oral cavity by maintaining pH as well as viscosity levels. Therefore saliva acidity level (pH) and its viscosity can be used to indicate oral cavity condition. Food plays an important role to affect the salivary pH and viscosity.**Objective** : to determine thedifference of salivary pH and viscosity after consuming white rice, cilembu sweet potato and purple sweet potato.**Materials and methods**: an experimental clinical study with pre-post time series design. Ten subjects consumed 100 grams of the selected food and the saliva would be takenat5, 15, 30, 45,and 60 minutes. The foods would be changed every 7 days.**Result** : Consuming both sweet potetos able to showe low pH level compare to that of consuming rice. **Conclusion** : there was a significant higher pH and viscosity difference after consuming cilembu sweet potato and purple sweet potato compare to that of white rice.

Keywords: cilembu sweet potato, purple sweet potato, salivary pH, white rice, salivary viscosity

INTRODUCTION

Saliva is a liquid substancewhich is secreted by the salivary glands that moistens and coats the human oral cavity. Saliva is one important element in the oral cavity, which has several functions, such as to keep the moisture in the oral cavity, lubricate and soften the food so that facilitate swallowing and tasting the taste of food, cleaning the oral cavity of the leftovers, cells, and bacteria so it can reduce the accumulation of plaque. [1]

Saliva as a liquid substance has viscosity and acidity (pH). The viscosity of saliva normally plays a role in digestion of food and motor functions such as mastication, speech and swallowing. The degree of acidity (pH) of saliva has a role as an inhibitor of decalcification process.[2]

The sweet potato is a carbohydrate -producing food that could potentially be an alternative staple food. Sweet potato varieties that are widely known by the people of Indonesia are Cilembu and purple sweet potatoes. In addition to high-carbohydrate, sweet potatoes are also rich in fiber and contain a number of vitamins and minerals. Sweet potato also has sweeter flavor than the white rice. However, in Indonesia sweet potato is often considered a lower-class society food because it is cheap and easy to grow. [3]

The sweet potato is known to have high fiber content and a sweet taste. High fiber content and clay-like consistency causes the process of mastication to be harder and thus require longer mastication time. Longer mastication time can stimulate the salivary glands to produce saliva. In a stimulated state, parotid salivary glands have a greater contribution in producing saliva than other salivary glands. Stimulation of the parotid salivary gland can cause a drop in the viscosity of saliva because of the parotid salivary glands producing saliva with low viscosity. Low viscosity causes high salivary flow rate which can maximize the cleaning process of the oral cavity so that the food is not attached to the teeth too long and cause caries. [4]

MATERIALS AND METHODS

This research is a clinical experimental research with pre and post test design. The study was conducted at Bioscience Laboratory of Faculty of Dentistry, University of Jember on 10 respondents. The respondents were asked to fast for 12 hours before consuming foodstuffs. Respondents' oral hygiene was then measured using Simplified Oral Hygiene Index (OHI-S) and then asked to brush their teeth before then checked using disclosing agent. Given foods are white rice, Cilembu and purple sweet potato. Respondents then were asked to consume a food type in 10 minutes. Food type wasthen changed every 1 week. Respondents were asked to collect saliva to examine the pH and viscosity before and 5, 10, 15, 30, 45, and 60 minutes after food consumption.

RESULTS

Results of research conducted on 10 respondents in theBioscience Laboratories Faculty of Dentistry, University of Jember. Measurements are shown in Tables 1, 2 and 3.

Tables 1, 2 and 3 show the test food ingredients. The greatest decrease in pH found in subjects who consume cilembu sweet potato, amounting to 6.2 followed by the subjects who consumed the purple sweet potato amounting to 6.4 and white rice at 6.493. In all three test food ingredients, salivary pH decrease occurred in the 5th minute and been rising over the next minute until the pH of saliva gradually returned to normal.

Salivary viscosity measurements are performed before and after the test subjects consume food. The results of viscosity measurement of saliva in all three test food ingredients can be seen in Figure 1.

Table 1. The results of measurement of salivary pH after consuming white rice (Oryza sativa) for 60 minut

N	Time (in minutes)						
	0	5	10	15	30	45	60
1	7,08	6,55	6,68	7,01	7,06	6,98	6,96
2	6,98	6,46	6,65	7,03	7,05	6,97	7,00
3	6,93	6,50	6,72	6,94	6,97	6,98	7,02
4	7,02	6,47	6,69	6,93	7,00	6,89	6,97
5	6,95	6,43	6,70	6,98	7,01	7,07	6,99
6	7,03	6,50	6,64	7,02	6,98	7,03	7,09
7	7,06	6,52	6,71	7,10	7,03	6,97	7,08
8	6,97	6,53	6,71	7,07	6,99	7,02	7,01
9	7,03	6,49	6,69	6,96	7,04	6,93	6,98
10	6,90	6,48	6,70	6,94	7,00	6,95	7,06
Mean	7,00	6,50	6,699	7,00	7,01	6,98	7,01
Standard of Deviation	0,59	**0,35**	0,26	0,58	0,31	0,52	0,46

Annotation : N : number of subject; Standard of deviation : amount of dispersion

Table2. The results of measurement of salivary pH after consuming cilembu sweet potato (Ipomoea batatas cultivar cilembu) for 60 minutes

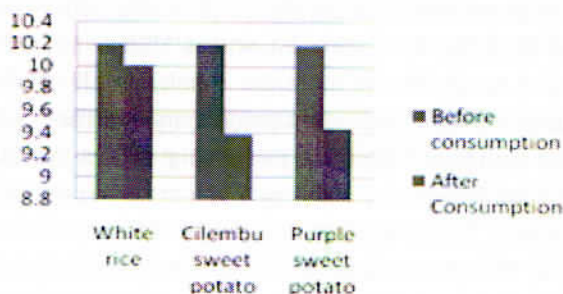| N	Time (in minutes)						
	0	5	10	15	30	45	60
1	6,93	6,18	6,39	6,73	7,02	6,97	7,00
2	6,96	6,20	6,35	6,70	7,03	6,95	7,02
3	7,01	6,23	6,39	6,74	6,96	7,00	6,98
4	6,94	6,16	6,32	6,72	7,01	7,03	6,95
5	6,98	6,24	6,33	6,72	7,04	6,99	7,03
6	6,99	6,17	6,31	6,78	6,95	7,03	6,99
7	6,93	6,22	6,36	6,73	6,96	7,01	6,94
8	7,02	6,20	6,34	6,75	7,01	7,02	6,99
9	7,03	6,18	6,36	6,70	7,02	6,98	7,02
10	6,94	6,22	6,35	6,72	7,05	6,99	7,03
Mean	6,97	6,20	6,35	6,73	7,01	7,00	7,00
Standard of Deviation	0,38	0,27	0,27	0,24	0,36	0,26	0,32

Table 2. The results of measurement of salivary pH after consuming purple sweet potato (Ipomoea batatas cultivar ayumurasaki) for 60 minutes

N	Time (in minutes)						
	0	5	10	15	30	45	60
1	7,05	6,35	6,55	6,83	7,04	6,99	7,03
2	7,09	6,42	6,63	6,89	7,05	7,02	6,97
3	7,08	6,39	6,68	6,77	6,99	7,04	7,06
4	6,97	6,36	6,59	6,72	7,02	6,97	7,05
5	6,96	6,45	6,54	6,78	7,03	6,99	7,02
6	7,04	6,43	6,60	6,84	6,94	6,92	6,99
7	6,97	6,48	6,63	6,79	6,97	7,05	6,95
8	7,09	6,37	6,53	6,77	6,96	7,01	7,03
9	7,02	6,30	6,53	6,83	7,01	7,05	6,98
10	7,06	6,45	6,67	6,86	7,03	7,06	6,99
Mean	7,033	6,400	6,595	6,808	7,004	7,010	7,007
Standard of Deviation	0,5078	0,5558	0,5662	0,5073	0,3718	0,4372	0,3622

Figure 1. Average viscosity of saliva

Figure 1 shows the change in the viscosity of saliva before and after consuming all three foods and a decrease in the value of salivary viscosity after eating. The highest viscosity after eating are found in subjects who consume white rice, while the lowest viscosity found in subjects who consume cilembu sweet potato.

Data analysis

Normality test results in salivary pH (Appendix B) showed p> 0.05, which means the data are normally distributed. Results of homogeneity test with 95% significance level (α

= 0.05) at pH of saliva showed p = 0.056 on white rice, p = 0.324 on cilembu sweet pot
and p = 0.5331 in purple sweet potato which means that the data is homogeneous. And
parametric test at pH indicate p <0.05, which means there is a significant difference to
pH of saliva after consuming white rice, cilembu sweet potato and purple sweet potato.
Parametric test results on the viscosity of saliva using paired T-test showed no correlat
on the viscosity of saliva before and after consuming all three food ingredients, but the
were significant differences after consuming all three food ingredients, namely white r
cilembu sweet potato and purple sweet potato.

DISCUSSION

Saliva is a liquid substance that can be found in the oral cavity of humans a
animals, which is secreted by the salivary glands. As a liquid substance, the salivary ha
degree of acidity which is called the pH of the salivary. Saliva has a buffer properties, wh
is a tendency of fluids to maintain its pH to be in a normal value. In normal individuals,
salivary pH ranging from 6.2 to 7.4. The value may decreased 15 minutes after a pers
consumes a food substance. The level of reduction in salivary pH can vary, depending
the type of food consumed, however, presence of buffer properties possessed by the sal
resulted in the pH of saliva returns to normal 30-60 minutes after eating.[5]

Results of research conducted on salivary pH after consuming white rice, Cilem
sweet potato and purple sweet potato indicates similarities, namely the existence
significant decrease in pH on the 5th minute. In white rice, Cilembu sweet potato and pur
sweet potato, the pH of saliva in the 5th minute towards 10th minute showed a significa
increase, as well as from the 10th minute towards 15th minute. In the 15th minute to
30th minute, there was no significant increase in salivary pH of of subjects who consum
white rice, whereas in subjects who consumed purple sweet potato and Cilembu swe
potato there is still a significant increase in salivary pH. In the 30th minute towards 6(
there were no significant differences in the pH subjects who consume Cilembu sweet pot
and purple sweet potato. This indicates that the pH of subjects who consumed white r
returned to normal on the 15th minute, while the the pH of subjects who consumed pur
sweet potato and Cilembu sweet potato returned to normal on the 30th minute.

Results of research on the viscosity of saliva showed that the viscosity of sali
is highest in subjects who consumed white rice, which means that the viscosity of sali
is more viscous in subjects who consume white rice. This is due to cooked rice contai
less fiber than sweet potatoes. In subjects who consumed sweet potatoes, there is
lower viscosity of saliva, which means more watery saliva. This is due to sweet potato
contains a lot of fiber, in which subjects had to chew a lot more to soften the the food befo
swallowing. No significant difference between the viscosity of saliva in the consumption
purple sweet potato with a viscosity of saliva in the consumption of Cilembu sweet pota
This is due to purple sweet potato and Cilembu sweet potato has about the same textu
so that mechanical stimuli generated from consuming both types of sweet potatoes did r
differ significantly [6].

CONCLUSION

Conclusions from the study "The Difference of salivary pH and Viscosity After Consuming White Rice (*Oryza sativa*), Cilembu Sweet Potato (*Ipomoea batatas cultivar cilembu*) and Purple Sweet Potato(*Ipomoea batatas cultivar ayumurasaki*)" is there are differences in pH and viscosity of saliva before and after taking the three types of food.

SUGGESTION

Suggestions from this study is there needs to be more research to better understand the factors that affect salivary pH and salivary viscosity and the relationship between the consumption of foods and salivary pH and viscosity.

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Main Lecture

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FDI - PDGI Joint Meeting
Good oral health for brighter smile
Bandung, 11 - 12 Nov 2016
Aston Primera Pasteur

Dr. Derek Mahony
Diagnosis and Treatment of a Gummy Smile

(Received Dental Training at the University of Sydney, Australia, Master's degree in Orthodontics from Eastman Dental Hospital, London, Editor of Journal of Clinical Paediatric Dentistry, International Orthodontic Journal, and Spanish Journal of Dentofacial Orthopaedics)

Learning Objective :
a. Communicate effectively with patients regarding treatment options for a gummy smile
b. The role of periodontics, orthodontics, prosthodontics, and orthognatic surgery in the treatment of a gummy smile
c. Differentially diagnose the aetiology of the gummy smile

Dr. Chai Wei Lin
The Management of Patients with some Medically and/or Surgically Induced 'Medical Conditions'.

(PhD from the University of Sheffield, Lecturer at The Department of Diagnostic and Integrated Dental Practice, Faculty of Dentistry, University of Malaya, Editor of the Malaysian Dental Journal)

Learning Objective :
a. Acquire an update on the dental management of patients with several new 'medical conditions', in particular medication induced osteonecrosis of the jaw
b. Understand the implication of newer oral anticoagulant therapy such as Rivaroxaban and the Dabigatran
c. Understand the controversy in antibiotic prophylaxis protocol for infective endocarditis and prosthetic joint replacements

Nicola Cirillo, DMD, LDS MHE(I), GCEd(HE), PGCertPH, PhD
Detection of oral potentially malignant lesions: few minutes to save a life".

(Associate Professor in Dental Medicine, Pathology, Pharmacology. Melbourne Dental School and Oral Health CRC Faculty of Medicine, Dentistry and Health Sciencec. The University of Melbourne, Australia.

Stephen T.H. Tjoa DDS, MSc., MS.
Tooth Autotransplantations

(Received Certificate in Orthodontics, Department of Orthodontics, University of Pennsylvania, School of Dental Medicine, Philadelphia, PA. Practice at Erasmus MC - Sophia Children's Hospital Department of Orthodontics, Rotterdam, The Netherlands)

Dr Lim Tong Wah
Composite Resin Artistry: How to create the best!

BDS (Malaya), MClinDent in Prosthodontics (London), MProsRCS (Edinburgh), Fellowship in Advanced Periodontology & Implantology (Genova)

Dr Lim qualified in Dentistry from Faculty of Dentistry, University of Malaya in 2006. He completed his full time specialist training in Prosthodontics at the Dental Institute at Guy's Hospital, King's College London, from 2009 – 2012 and passed the Membership in Prosthodontics Examination, Royal College of Surgeon, Edinburgh in 2012. He is also an accredited specialist in Prosthodontics registered with National Specialist Register. He has been recently awarded with Fellowship in Advanced Periodontology and Implantology from University of Genova, Italy this year.

Call for Abstracts

The Organizing Committee cordially invites abstract submission for oral and poster presentation at FDI BANDUNG 2016. Abstracts of the below topics are welcome. Outstanding abstracts will be selected by the Organizing Committee for oral and poster presentation. Accepted abstracts will be published in the programme and proceeding book. These are an optional topics :

Community Dentistry
Dental Materials
Endodontics
Geriatric Dentistry
Implantology
Neuroscience / TMD
Operative Dentistry
Oral Medicine / Oral Pathology / Oral Cancer

Oral Microbiology
Oral Radiology
Oral Surgery
Oral Anaesthesiology
Orthodontics
Paediatric Dentistry
Periodontics
Prosthodontics

Submission Guidelines

Only online submission is available. Abstracts must be written in English. The length of the abstract should be one-page A4 size long or in around 250 words only. Submissions do not comply with our requirement will not be considered. For enquiry, please email : fdi.2016@pdgi.or.id

Abstract Preparation Guideline

1). The content of the abstract should include the following: Objectives, Subjects and Methods, Results and Conclusions. However, it is not necessary to organize the abstract under different headings.
2). Type the abstract using single-line spacing (1 spacing) with 12-point font (Times New Romans).
3). Please type clearly the title of the abstract, name(s) of the author(s), the name of institution, the country of origin on the top of the form, and underline the name of the presenting author. The title should be informative and as specific as possible.
5). The title should be in CAPITALS and in bold at the top of the abstract. Avoid using abbreviations in the title.
6). Type name(s) of author(s) with initials first, e.g. E. Lau. The authors' name should be followed by the details of the institutions (Department, Institution, Country).

Content of Full Paper

1). Research Article: Background, Objectives, Methods, Results, Discussion, Conclusion, Acknowledgement, and References
2). Case Report Article: Background, Objectives, Case Report and Management, Discussion, Conclusion, Acknowledgement, and References
3). Literature Study Article: Background, Objectives, Discussion, Conclusion, Acknowledgement, and References
4). Title: Article is initiated with the title of the article, followed by authors name, affiliation and authors complete address institution(s), and e-mail address of author to whom correspondence should be sent.
5). Abstract: Should be written in English, include a maximum 250 word, unstructured however contains of background, aim of study, materials and methods, results and conclution. 3-5 key words are listed in order of importance and placed below the abstract.
6). References : References according to Vancouver style

Oral Presentation

· Slide could be written in English
· Main Lecture: 45 min. presentation + 15 min. discussion
· Short Lecture: Oral 3 presenters (each 15 min. presentation) + 15min. discussion