EFFECT OF TYPE AND CONCENTRATION OF NITROGEN SOURCES ON SEVERAL CHARACTERISTICS OF COCONUT SAP (*NIRA*) NATA

NURUL AZMAH BINTI MAT AMIN

FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE
UNIVERSITI MALAYSIA TERENGGANU
2012

EFFECT OF TYPE AND CONCENTRATION OF NITROGEN SOURCES ON SEVERAL CHARACTERISTICS OF COCONUT SAP (*NIRA*) NATA.

By

Nurul Azimah Bt Mat Amin

Research Report submitted in partial fulfillment of the requirements
for the degree of
Bachelor of Food Science (Food Technology)

DEPARTMENT OF FOOD SCIENCE
FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE
UNIVERSITY MALAYSIA TERENGGANU
2012

ENDORSEMENT

The project report entitled **'Effect of Type and Concentration of Nitrogen Sources on Several Characteristics of Coconut Sap (*Nira*) Nata'** by **Nurul Azimah bt Mat Amin, UK17965** has been reviewed and corrections have been made according to the recommendations by examiners. This report is submitted to the Department of Food Science in partial fulfilment of the degree of Food Science (Food Technology), Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu.

(ZURAIDAH NASUTION)
Main Supervisor

ZURAIDAH NASUTION
Pensyarah
Jabatan Sains Makanan
Fakulti Agroteknologi dan Sains Makanan
Universiti Malaysia Terengganu
21030 Kuala Terengganu

Date: 16/2/2012

(DR MOHD NIZAM LANI)
Co- Supervisor

DR. MOHD NIZAM LANI
Pensyarah Kanan (DS52)
Jabatan Sains Makanan
Fakulti Agroteknologi dan Sains Makanan
Universiti Malaysia Terengganu
21030 Kuala Terengganu

Date: 16/2/2012

DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

Signature : ....

Name : Nurul Azimah binti Mat Amin

Matric No : UK 17965

Date: 16/2/12

ACKNOWLEDGEMENT

At the end of my thesis, I would like to thank all those people who made this thesis possible and a meaningful experience for me. First of all, my deepest sincere grattitude goes to my supervisor, Ms Zuraidah Nasution, for her willingness to supervised this project, her time, her advice, her comments and her guidance for me to improve and all lectures for their guidance and consent.

To all my friends, thank you for being a good listener and lending me your hand while i had to face difficulties to continue this project. Hopefully all of you will be successful in your future. I also want to thank all laboratory staff in Food Science Laboratory, Food Service Laboratory, Food Technology Laboratory and Food Chemistry Laboratory for helping and guiding me during my final year project.

Finally, I also want to express my deepest gratitude to my lovely family for all supports and emotional understanding. Thank you for everything.

ABSTRACT

Coconut sap (nira) is tapped from coconut spadix and largely consumed in rural area. *Nira* must be processed under hygienic environment otherwise it will rapidly ferment due to its perishable characteristic. Processing *nira* for the production of nata using *A. xylinum* is considered beneficial not only to add variety in raw material of nata but also to produce a shelf stable product. An experiment designed as two-way treatment was carried out to determine effect of type and concentration of nitrogen sources on total viable count during production of coconut sap (*nira*) nata, physical characteristics of nata produced from *nira* including color, hardness, elasticity, water holding capacity and final pH, chemical properties of nata produced from *nira* including proximate composition and dietary fiber content and also to assess sensory acceptance of nata produced from *nira*. There were two independent variables applied. The first one is the type of nitrogen source (organic nitrogen, inorganic nitrogen and mixed organic and inorganic nitrogen) and the second one is concentration of nitrogen sources (0.25% and 0.5%). Interaction between between types of nitrogen source and concentration of nitrogen source significantly affected thickness, yield, water holding capacity and color of nata produced from *nira*. Types of nitrogen sources alone significantly affected pH of *nira* media. Formulation with 0.25% of yeast extract mixed with ammonium sulphate is the suggested treatment since it gave high product yield (83.7%) with good physical characteristics (desired thickness, high whiteness, sufficient hardness and thickness) , high sensory acceptance and high dietary fiber content.

ABSTRAK

Nira kelapa ditoreh daripada tandan kelapa muda dan sebahagian besarnya diguna di kawasan luar bandar. *Nira* mesti diproses di bawah persekitaran yang bersih jika tidak ia akan menapai dengan cepat disebabkan oleh sifatnya yang mudah rosak. Pemprosesan *nira* untuk menghasilkan nata dengan meggunakan *A. xylinum* dianggap bermanfaat kerana ia tidak hanya dapat menambah kepelbagaian bahan mentah bagi nata tetapi juga dapat menghasilkan produk yang mempunyai jangka hayat yang stabil. Kajian yang direka dengan rawatan dua-hala telah dijalankan untuk menentukan kesan bagi jenis dan kepekatan sumber nitrogen yang diguna terhadap jumlah kiraan sel yang nampak semasa penapaian nata dari *nira* kelapa, ciri-cir fizikal bagi nata yang tdihasilakan dari *nira* kelapa termasuk warna, kekerasan, keanjalan, kebolehan memegang air dan pH, ciri- ciri kimia bagi nata yang dihasilkan dari *nira* termasuk komposisi proksimat dan kandungan serat pemakanan dan juga untuk menilai penerimaan deria bagi nata yang dihasilkan dari *nira*. Terdapat dua pembolehubah tetap yang digunakan. Yang pertama adalah jenis sumber nitrogen (nitrogen organik, nitrogen tak organik dan campuran antara nitrogen organik dan tak organik) dan yang kedua adalah kepekatan sumber nitrogen (0.25% dan 0.5%). Interaksi antara dua jenis sumber nitrogen dan kepekatan sumber nitrogen secara ketara mempengaruhi ketebalan, hasil, kebolehan memegang air dan warna bagi nata yang dihasilkan dari *nira*. Jenis sumber nitrogen sendiri secara ketara mempengaruhi pH bagi media *nira*. Rawatan dengan 0.25% ekstrak yis dicampur dengan ammonia sulfat adalah rawatan yang disarankan kerana ia tinggi pengasilan (83.7%) dengan ciri-ciri fizikal yang baik (ketabalan yang diinginkan, nilai keputihan yang tinggi, kekerasan dan ketebalanyang mencukupi), tinggi penerimaan deria dan tinggi kandungan serat pemakanan.