

**Penelitian/Research**

**PENGARUH PERUBAHAN RANCANGAN ANGLO DAN BERAT JENIS BRIKET ARANG TERHADAP PENINGKATAN EFISIENSI PENGGUNAAN PANAS**

*The Effect of Stove Change Design and The Specific Gravity Briquette Bamboo Charcoal to Increasing of Heating Efficiency*

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**ABSTRACT:** Experiment on the use of modified *anglo* (rural type of stove) and density of bamboo charcoal briquette of *Andong* (*Gigantochloa pseudoarundinaceae*) and *Petung* (*Denrocalamus asper*) have been carried out to increase its heating efficiency. Observation was carried out on temperature profile, temperature elevation rate, fuel consumption rate and heating efficiency. Analysis on the charcoal briquettes includes moisture content, volatile substance on 950 °C, fixed carbon and calorific value.

The experiment revealed that the use of bamboo charcoal briquette of *Andong* and *Petung* with density respectively of 0.484 and 0.488 in unmodified traditional *anglo* give heating efficiency of respectively 16.36 % and 17.4 %. Whereas by increasing the density of bambu charcoal of *Andong* and *Petung* to respectively 0.5689 gr/cm<sup>3</sup> and 0.5021 gr/cm<sup>3</sup> and reducing the ventilation of *anglo*, the heating efficiency can be increased to respectively 40.27 % and 45.06 %. Moreover, the tested bamboo charcoal briquette of *Andong* has moisture content of 6.83 % (wb), volatile substance at 950 °C of 22.71 %, fixed carbon of 71.15 % and calorific value of 6668 cal/g, whereas the bamboo charcoal briquette of *Petung* has moisture content of 4.25 % (wb), volatile substance at 950 °C of 25.48 %, fixed carbon of 68.19 % and calorific value of 5018 cal/g.

*Keywords :* *briquette charcoal, stove, temperature profile, temperature elevation rate, fuel consumption rate a heating efficiency.*

**Penelitian/Research**

**PEMBUATAN PELUMAS DASAR *ROLLING OIL* DARI MINYAK JARAK KEPYAR (CASTOR OIL) DENGAN PENAMBAHAN LARUTAN KITOSAN**

*The Production of Rolling oil Lubricant Using Castor Oil and Chitosan Solution*

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**ABSTRACT:** Rolling oil is one kind of the lubricants which is used for metal working especially for cold rolling mill (CRM), roll collant, roll oil and pickle oil. Mostly, lubricant based rolling oil was derived from mineral or synthetic oil where its source has been depleted. Castor oil has some advantages to be employed for lubricants or rolling oil based materials since it has high load wear index lubricity, and viscosity as well as low pour point. This research was aimed at investigating the production of rolling oil using castor oil with oxidation treatment and without oxidation treatment. Chitosan was also used to know its effect on rolling oil characteristics. The method of rolling oil production was designed by adding NaHSO<sub>4</sub> as catalyst into castor oil, dehydrating of castor oil at 200°C during three hour, cooling of castor oil at room temperature, dissolving butylated hydroxy toluene (BHT), dehydrating oil (oxidation) at 100°C during 8 hours, addition of 1 %, 3 % and 5 % of chitosan solution into oil, and dissolving O-fenilfenol into oil. Similar procedure also had been conducted for castor oil without oxidation treatment. Rolling oil with oxidation treatment showed better result in term of acid number, iodine number, viscosity, and density. The best result of experiments was showed for the oxidized rolling oil with dehydrated treatment with 5 % chitosan solution which has acid value 1,1 mg KOH/gr oil, iodine number 59,3 gr iod/100gr oil, saponification value 196,9 mg KOH/g oil, viscosity 180,6 cps, density 0,97 gr/ml. In conclusion higher chitosan concentration resulted lower acid and saponification value. On the other hand higher chitosan concentration affected higher iodine number and viscosity.

**Key words:** *Rolling oil, lubricants, castor oil, emulsifier, and chitosan*

**Penelitian /Research**

**PENGARUH PENGGUNAAN KHITOSAN PADA KONSENTRASI YANG BERBEDA DALAM FORMULASI PELEMBAB KULIT**

*The Effect of Use Chitosan on Difference of Concentration for Formulation of Skin Lotion*

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**ABSTRACT** : Chitosan is produced commercially in large scale from the other shell of crustaceans as shrimp and crab. At moment chitosan is not used in pharmacy industry but could for other industry as cosmetic, food and beverages. In cosmetic industry as for skin care preparation like skin lotion, chitosan used for humectant, emulsifier and stabilizer. The aim of this research is to study the effect of chitosan as humectant, emulsifier and stabilizer in hand and body lotion formulation. In this experiment, chitosan was added to hand and body lotion product with several concentration level e.g. (F1) without chitosan; (F2) 3 ppm of chitosan; (F3) 5 ppm of chitosan; (F4) 10 ppm of chitosan and (F5) 25 ppm of chitosan. Hand and body lotion produced was tested with some testing parameters including homogeneity, pH, viscosity, emulsion stability, evaporation and organoleptic for colour, aroma and stickiness. The result showed that the best treatment was F3 (5 ppm of chitosan), the best of homogeneity level, averages pH 6,37, viscosity 1660 cps, evaporation only 78,29 % and organoleptic test score averages was 4,02.

*Keywords: chitosan, skin lotion, formulation, cosmetic product, emulsifier*

Penelitian/Research

**PENGARUH SUHU REKONSTITUSI TERHADAP ISOLAT LOKAL *Enterobacter sakazakii* (*Cronobacter* sp.) ASAL SUSU FORMULA DAN MAKANAN BAYI**

*The Effect of Reconstitution Temperature for Local Isolates of Enterobacter sakazakii (Cronobacter sp.) from Powdered Infant Formula and Weaning Food*

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**ABSTRACT:** *Enterobacter sakazakii* (recently known as novel genus *Cronobacter* sp.) is opportunistic bacteria which can cause severe meningitis in neonates. Eight isolates of *E.sakazakii* which previously isolated from powdered infant formula (PIF) and weaning food were tested for their ability to survive during reconstitution with water having various temperatures, and their fate during hang time in comparison with 7 isolates previously described by Estuningsih and *E.sakazakii* ATCC 352/7. Reconstitution with 100°C water decreased the number of bacteria of most isolates to undetectable level, while those with 40°C and 4°C water did not reduce the bacterial number significantly. Using water of 70°C, reconstitution decreased the number of bacteria of 10 isolates to undetectable levels; however 6 isolates survived the reconstitution temperatures. The hang time test showed that some bacteria which were not detected after reconstitution with 70°C water became detectable after 2 hours. Those surviving reconstitution with 70°C grew well during hang time for 2 to 8 hours.

Keywords: *Enterobacter sakazakii*, *Cronobacter* sp., Powdered Infant Formula, Reconstitution, Hang Time

Penelitian/Research

**PENGARUH LAMA OKSIDASI TERMAL DAN JENIS MINYAK GORENG TERHADAP  
PEMBENTUKAN ASAM LEMAK *trans* DAN KUALITAS MINYAK GORENG**

*The Effect of Thermal Oxidation Time and Frying Oils to trans Fatty Acid Forming and Quality of Frying Oils*

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**ABSTRACT:** *Trans* fatty acid from commercial frying oils (coconut oil, palm oil, soybean oil and corn oil) were identified to study the effect of thermal oxidation to *trans* fatty acid forming. Parameters of oil quality analysis were iod number, free fatty acid, peroxide number, percentage of conjugated diene and conjugated triene, and *Thiobarbituric Acid* (TBA) value. The analysis of *trans* fatty acid and composition of oils used gas chromatography with 75 m capillary column from Supelco SP-2560. Standardized methodologies used for fatty acid methyl ester, quantification of *trans* fatty acid and oil quality analysis. Heating treatment for thermal oxidation was done from initial temperature 180°C in 0 minute and heating time continued until 30, 60, 90 dan 120 minute. *Trans* fatty acid was identified as C18:2;9c,12t isomer from palm oil, soybean oil and corn oil. These *trans* fatty acid were presented at 0,02-0,32% before heating process and 0,04-9,8% after heating process. *Trans* fatty acid were formed from their natural *cis*-isomer as result of the high temperature used. Fatty acid composition of frying oils decreased as effect of thermal oxidation. Based on frying oils quality analysis, thermal oxidation decreased the quality of frying oils. Heating time have corellated with decrease of iod number for all of frying oils. Heating time also corellated with increase of free fatty acid, peroxide number, percentage of conjugated diene and TBA value. *Trans* fatty acid could be form from thermal oxidation. Results of oils quality analysis, thermal oxidation decreased oils quality and fatty acid composition .

*Keywords: trans fatty acid, thermal oxidation, fatty acid composition, oils quality*