Postharvest Technology Division

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Contents

PHYSICOCHEMICAL PROPERTIES AND BIOACTIVE COMPOUNDS OF SOME SELECTED COFFEE LINES AND CASHEW NUT IN HILLY AREAS OF BANGLADESH

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Abstract

This study was conduct to generate information on physicochemical and bioactive compounds of selected coffee and cashew nut line in hilly areas of Bangladesh. Six coffee lines and 3 coffee samples were collected from Khagrachari and two cashew nut samples were from local cashew nut processors. Six coffee lines and 3 coffee samples exhibited the range of percent moisture, dry matter, ascorbic acid content, fat, starch, beta-carotene, phenolic compounds, and antioxidant capacity were from 2.22 to 12.24%, 82.20 to 98.31%, 5.80 to 123.48 mg/100g, 12.54 to 18.35%, 28.84 to 36.80%, 6.25 to 76.23 mg/100g, 88.23 to 163.13 GAE/100g, 60.57 to 77.29 % inhibition, respectively where as non-roasted and roasted cashew nut samples showed the percent moisture, ash, ascorbic acid, titratable acid and antioxidant were 0.77 & 1.41%, 1.67 & 1.53%, 3.27 & 4.47 mg/100g, 0.38 & 0.55%, 53.47 & 47.99 % inhibition, respectively.

EFFECT OF HEAT STRESS AND EDIBLE COATING ON IMPROVING QUALITY RETENTION AND SHELF LIFE OF MANGO FRUIT DURING AMBIENT STORAGE

M.G.F. CHOWDHURY, M.H.H. KHAN, M.M. RAHMAN, M.M. Molla, M.S AKHTER, A.A. SABUZ

Abstract

This experiment was conducted to study the effect of hot water treatments and fruit coatings that stimulate the fruit antioxidant system and will maintain postharvest quality of mango at ambient storage condition. BARI Aam-3 dipped into hot water at 55°C for 5 mins and wax coating was applied as a surface coating. Postharvest treatment was applied to control disease for the study. Fruit immediately after HWT using hand applicator on a washing & waxing line or left uncoated. Among the treatments, hot water treatment with Endura Fresh ™370) coated fruit performed best in terms of overall quality, and it significantly reduced weight loss (~9%) after 18 days fruit harvested. Wax coated fruit significantly increases fruit peel appearance and coated fruit also showed more firmer than non-coated fruit after 3 weeks.

EFFECT OF VACUUM FRYING ON THE NUTRITIONAL AND KEEPING QUALITY OF PINEAPPLE CHIPS

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Abstract

The aim of the study was to evaluate the effect of vacuum fried pineapple chips processing using BARI developed vacuum fryer at suitable frying temperature and time. Uniform size of pineapple were collected and peeled and then thinly sliced. Corn flour (16% & 18%) were added with raw chips and stored in the refrigerator (-14^{o}C) for 12-24 hrs. Pineapple chips were vacuum fried at 100, 105 and 110ºC for 60 mins and then were de-oiled at 1400 rpm for 2 mins and packed in metalex foil packet (3 layer, ~60 micron) for 3 month quality evaluation. Pineapple chips mixed with 16% corn flour and then fried at 105^{o}C for 60 mins performed better among the treatments in terms of quality attributes and shelf life during 3 months of storage.

A COMPARATIVE STUDY ON THE USE OF COOKING OILS, FOOD HABITS, DIETARY HABITS, LIFESTYLE HABITS AND HEALTH ATTITUDES WITH THE FOCUS TO RURAL, PERI-URBAN AND URBAN PEOPLE IN BANGLADESH

M.M.MOLLA, M.H.H.KHAN, A.A.SABUZ, S.PERVIN, M.G.F.CHOWDHURY, M.M.RAHMAN, B.C.DEY AND P. SEN

Abstract

The purpose of the study was to find out the different cooking oils and mostly used cooking oils and explore the health attitudes regarding food and lifestyle habits of the respondents. Results reveal that 80-82 % people consume soybean oil, 10-12 % people mustard oil, 3-4 % people extra virgin olive oil and 1-2 % extra virgin coconut oil. Approximately 76.90 % respondent goes to late sleeping from

11:00-12:00 am, arise in the morning (5:00-6:00 am) 46.20 % and 84.60 % respondents do not walk and exercise regularly. During the study, the heart attack, stroke, high blood pressure and diabetes were recorded as 25 %, 37.50 %, 25 % and 12.50 % respectively. The highest consumption oil was recorded as 10 L per family consisted 3-6 members.

SHELF LIFE EXTENSION OF PINEAPPLE POMACE BALL (LADDU) THROUGH POSTHARVEST TREATMENTS

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Abstract

The purpose of the study was to develop pineapple by-product (small ball-laddu) using pineapple pomace. There were four treatments with 3 replications and the experiment was laid out in complete randomized design (CRD). Then developed laddus were stored in polyethylene Terephthalate (PET) boxes at ambient temperature for storage studies. The studies confirmed that all treated potassium metabisulphite (KMS), potassium sorbet (KS) and KMS+KS treated laddus could be extended more than 60 days, whereas the control sample could be stored up to 30 days only.

THE NUTRITIONAL, PHYSICOCHEMICAL, MINERALS AND BIOACTIVE COMPOUNDS ANALYSIS OF COOKED LENTIL

M.M.MOLLA, M.H.H.KHAN, A.A.SABUZ, S.PERVIN, M.G.F.CHOWDHURY, M.M.RAHMAN, B.C.DEY AND P. SEN

Abstract

An attempt has been taken to cook lentil with edible portion and peel to determine their nutrition and antioxidant status as a part of reducing milling cost. All the analysis was performed by internationally recognized method using HPLC and Double Beam Spectrophotometer. Then the obtained data has been verified with reputed national and international journals and books. Results revealed that lentil cooked with peel is the rich source of physicochemical nutritional and antioxidant activities. Highest crude protein (28 %) and lower fat (5.73 %) was recorded in lentil cooked with peel. Sensory data also confirmed that all the evaluator was highly satisfied to the cooked lentil with peels although non-significant differences were found between peel and without peel.

EFFECT OF MOISTURE CONTENT ON RECOVERY PERCENTAGE OF LENTIL DURING DEHULLING PROCESS

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Abstract

An investigation was carried out to determine the effect of moisture content on recovery percentage of lentil during dehulling. It was bothering to maintain desired moisture level. There was five moisture level viz. 6 %, 8%, 10%, 12% and 14 %. The desired moisture levels were maintained by adding calculated amount of distilled water, thoroughly mixing and then sealed in separate polythene bags. The sealed lentil was kept at 5 °C in a refrigerator for 7 days to allow a uniform distribution of moisture throughout the lentil. Before conducting the test, the required quantity of lentil was allowed to warm up to room temperature for 12 h for conditioning. Results revealed that 8% moisture contributed to get maximum recovery percentage of lentil during dehulling.

EFFECT OF DIFFERENT MILLING METHODS ON RECOVERY PERCENTAGE OF LENTIL

M.M.MOLLA, M.H.H.KHAN, A.A. SABUZ, M.G.F. CHOWDHURY, S.PERVIN, M.M.RAHMAN, B.C.DEY, P.SEN, M.S.ZAMAN, R.PODDER, P.BHOWMIK AND A.KHATUN

Abstract

A study was conducted to investigate the effect of different milling on recovery percentage of lentil. It was difficult to prepare uniform seeds during milling as it is pre-requisite to get highest recovery yield. Maximum dehulling efficiency (DE) (87.03 %), milling recovery (MR) (75.19 %) percentage and football recovery (FR) (8.11 %) was obtained by the commercial dehuller than others. Lowest broken (14.2 %) and powdery percentage (1.78 %) was also observed by the commercial dehuller.

Local pulse dehuller operated manually caused significant losses in yield by enhancing higher broken percentage (36.04 %) and powder form (10.31 %). The study recommends using clean and uniform seeds for maximizing the good milling recovery yield with football recovery percentage.

OPTIMIZATION OF PROCESSING METHOD FOR PLUM JAM AND ANALYSIS OF THE CHANGES IN QUALITY CHARACTERISTICS DURING STORAGE

S. PERVIN, M.H.H KHAN, M.G.F. CHOWDHURY, M.M. MOLLA AND A.A. SABUZ

Abstract

Plum is a versatile fruit with limited availability during a specific season. To promote year-round consumption, plum can be processed into value-added products like jam. This study aimed to optimize the processing method for plum jam using the BARI Alu bukhara-1 variety and investigate the changes in quality characteristics during 12 months of storage. Five treatments with varying sucrose percentages were analyzed. The pH decreased during storage, while acidity decreased significantly. The color intensity gradually shifted from light-yellow to light red. Microbial growth was not observed for up to nine months, and panelists favored jam made with 100% sucrose for its balanced sweetness and appealing flavor. The findings contribute to enhancing plum utilization and providing a nutritious and convenient food option through plum jam consumption.

STANDARDIZATION OF PROCESSING METHOD FOR OSMO DEHYDRATED SUGAR COATED PLUM

S. PERVIN, M.H.H. KHAN, M. M. MOLLA, M.G.F. CHOWDHURY AND A. A. SABUZ

Abstract

The study aimed to standardize the processing method for osmo-dehydrated sugar-coated plum to enhance its shelf life, overall quality and minimize postharvest losses. Plum fruits were treated with 40, 50, and 60 °Brix sugar syrup and sugar coating. Texture analysis revealed a decrease in firmness during storage due to cell structure breakdown and enzymatic activity. Color intensity decreased significantly over 12 months of storage, while total phenolic content declined with increasing brix and prolonged storage. Osmo-dehydrated plum exhibited excellent energy content. The highest overall rating was given to plum treated with 50 ^{0}Brix sugar syrup and sugar coating. In conclusion, osmotic dehydration with sugar coating is a viable method to enhance plum preservation and create a value-added product.

OPTIMIZATION OF PROCESSING METHOD FOR DRAGON FRUIT JAM

S. PERVIN, M.H.H KHAN, M.G.F. CHOWDHURY, M.M. MOLLA, A.A. SABUZ AND A.S.M.H. RASHID

Abstract

This research aimed to optimize the processing method for dragon fruit jam and assess its quality parameters during long-term storage at ambient temperature in Bangladesh. Five treatments were employed, varying the sugar content in the dragon fruit pulp. The pH, acidity, TSS (%), color, microbial growth, and sensory evaluation were conducted over a storage period of six months. The results revealed that higher sugar content led to lower initial pH and higher acidity in the jam. TSS values were highest in treatment T_5 (100% sugar in pulp). Color intensity decreased during storage, and microbial growth remained within acceptable limits. Sensory evaluation indicated that jam with 80% sugar in pulp (T_4) received the highest overall rating. These findings offer valuable insights for optimizing dragon fruit jam processing for extended shelf life and consumer acceptance.

STANDARDIZATION OF PROCESSING METHOD FOR DRAGON FRUIT JELLY

S. PERVIN, M.H.H KHAN, M.M. MOLLA, M.G.F. CHOWDHURY, M.M. RAHMAN AND A. A. SABUZ

Abstract

Dragon fruit jelly is a popular fruit-based product, and this study aimed to standardize its processing method and assess the changes in quality characteristics during storage at ambient temperature in Bangladesh. Six treatments were employed, varying the juice and sugar proportions in the jelly. The pH, acidity, TSS (%), color, and microbial growth were analyzed during a storage period of one year. The results indicated that the pH decreased and acidity increased over time. TSS increased during

storage with 33% juice+70% sugar in jelly exhibiting the highest level. Color intensity decreased and lightness values reduced during prolonged storage. Microbial growth was minimal and within acceptable limits for human consumption. Sensory evaluation revealed 33% juice+50% sugar in jelly was the highest overall acceptance.

BLANCHING EFFECT ON THE QUALITY AND SHELF LIFE OF TARO ROOT

S. PERVIN, M.H.H. KHAN, M.M. RAHMAN, M.G.F. CHOWDHURY, M.M. MOLLA, AND A. A. SABUZ

Abstract

Taro is a valuable tropical root crop in Bangladesh, but its perishable nature presents storage challenges. Blanching is commonly used to enhance product stability during freezing. This study investigates the effect of blanching on frozen taro roots to optimize storage and product quality. Seven blanching treatments were evaluated for physicochemical quality parameters over six months. Blanching significantly affected texture, color, and antioxidant property. Blanching at 80±1°C for 6 minutes demonstrated the most suitable attributes. Overall, blanching improved the shelf life and quality of frozen taro roots.

PRESERVATION OF AONLA BY OSMOTIC DEHYDRATION METHOD

S. PERVIN, M.H.H KHAN, M.M. MOLLA, M.G.F. CHOWDHURY, M.M. RAHMAN AND A. A. SABUZ

Abstract

The study aims to optimize dehydration conditions for producing high-quality value-added products with extended shelf life. Eight treatments were used to osmo-dehydrate aonla, and the physicochemical properties were analyzed during a 6-month storage period. The results revealed that the texture, vitamin C, and total phenolic content of osmo-dehydrated aonla decreased with increasing storage period and osmotic solution concentration. The color intensity also decreased significantly during prolonged storage. Sensory evaluation indicated that osmo-dehydrated aonla maintained overall acceptability throughout the storage period. Overall, the research demonstrates the potential of osmotic dehydration as an effective preservation method for aonla, yielding value-added products with enhanced quality and shelf life.

EFFECT OF MOISTURE LEVEL ON PROCESSING AND QUALITY OF LENTILCHIPS

M.M.MOLLA, M.H.H.KHAN, A.A. SABUZ, M.G.F. CHOWDHURY, S.PERVIN, M.M.RAHMAN, B.C.DEY, P.SEN, M.S.ZAMAN, R.PODDER, P.BHOWMIK AND A.KHATUN

Abstract

The study was conducted to develop lentil chips through find out the proper moisture level and barrel temperature of the single screw extruder. The single screw extruder was installed successfully in the postharvest Technology Division of BARI. Several trial based on moisture level has been done and outlet dice of the single screw extruder has been modified to develop quality chips. Then the product has been incorporated to evaluate by forming of judgments panel groups consist of interdisciplinary trained scientists, staffs and child (6-10 years). Then the quality product has been packed into metalex and polypropylene pouches for storage studies at ambient condition. Results show that moisture at 20% conditioning 2-3 h produced high quality chips that have been acceptable by the consumers.

THE PHYSICOCHEMICAL, NUTRITIONAL, MINERALS AND BIOACTIVE COMPOUND ANALYSIS OF DIFFERENT EDIBLE PARTS OF SELECTED BARI KACHU VARIETIES

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Abstract

The purpose of the study was to analyze the physicochemical, nutritional, bioactive compounds and minerals of different edible portions of the BARI Pani Kachu varieties. The seven BARI Pani Kachu varieties were selected for the study. Results reveal that vitamin-C content found higher at rhizome (8.23±0.03 mg/100 g), stolon (18.10±0.10 mg/100 g) and leafblade (47.06±0.06 mg/100 g) of the BARI Pani Kachu-3. Petiole of BARI Pani Kachu-1 contained higher amount of vitamin-C (7.24±0.04 mg/100 g). Fe and Zn were highly present at rhizome and stolon portion of BARI Pani

Kachu-3 and BARI Pani Kachu-6. Leafblade of BARI Pani Kachu-6 was rich source of Fe (337.00±3.00 ppm) and Zn (56.86±0.04). Petiole of BARI Pani Kachu-5 and BARI Pani Kachu-6 was superior for Fe and Zn.

PHYSICOCHEMICAL AND QUALITY EVALUATION OF DRIED TOMATO SLICES

M.H.H. KHAN, M.M. MOLLA, S. PERVIN, M.M. RAHMAN, M.G.F. CHOWDHURY, A.A. SABUZ, B.C. DEY, P. SEN

Abstract

The main purpose of this study was to investigate the physicochemical and quality evaluation of dried tomato slices. Tomatoes were dried by two different methods viz. cabinet and freeze-drying and changes in nutrient content of tomato slices were examined. As a result of drying applications, the initial moisture content of fresh tomato samples was determined to be 95.43%, whereas dried samples ranged from 11.80% to 15.85%. Losses of nutritional contents of cabinet-dried samples were high compared to others. Between the methods used, it was observed that freeze-dried tomato slices scored highest for color and all other nutritional qualities. Thus, it could be concluded that the freeze-drying method resulted in better end products retaining natural color and nutrients, also employing a simple technique and minimal energy.

EFFECT OF MALTODEXTRIN AND SUGAR COATING ON NUTRITIONAL AND BIOACTIVE COMPOUNDS OF FREEZE-DRIED JACKFRUIT CHIPS

M.G.F. CHOWDHURY, M.H.H. KHAN, M.M. MOLLA, S. PERVIN, A.A.SABUZ, M.KAMAL

Abstract

The aim of the study was to standardize the freeze-dried jackfruit chips processing protocol by application of maltodextrin and sugar coating. Jackfruit chips were prepared from matured khaja type jackfruit. The harvested jackfruit was cut into halves and separated into the bulbs. The seed was removed, and bulb was sliced into about 5 mm thickness and treated with 5, 10, 15% maltodextrin and 40% sugar solution then packaged in high density polyethylene packet (~60 micron) and frozen at -18ºC for 24-36 hrs. Then the frozen slices were dried in freeze dryer at -53^{o}C for 72 hrs. The dried chips were packaged in foil (~50 micron) packet without nitrogen. According to the quality attributes, 10% maltodextrin coated slices exhibited better quality during 6 months of storage at ambient condition.

EFFICACY OF CLOVE ESSENTIAL OIL AND CARNAUBA WAX IN EXTENDING SHELF LIFE OF MANGO

M.M. RAHMAN, M.G.F. CHOWDHURY, M.H. H. KHAN, S. PERVIN, M.M. MOLLA, A. A. SABUZ, B. C. DEY, P. SEN

Abstract

The current experiment examined the effects of clove essential oil and carnauba wax coating for controlling stem end rot and anthracnose caused by *Botryodiplodia theobromae* and *Colletotrichum gloeosporioides,* respectively of mango to extend shelf life. Clove essential oil at 1 mlL^{-1} premixed with ethanol (1 mL L^{-1}) as stabilizer and Triton-X100 (40 mg L^{-1}) as surfactant in combination with carnauba wax has shown potential inhibition of the fungi with shelf life extension of mango. This experiment needs more trials for confrontation.

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