



Abstract of Research Reports

Food Industry Engineering & Postharvesting Technologies

2020

No.	Title	Page
1	Study on Methodology of Creating Original Geographical Quality Indication for Agri-Based Products In Iran	1
2	Survey on Creation of Research & Innovation Network of SMEs Of Wheat Value Chain	2
3	Effect of Ozone on Quality Characteristics and Shelf Life of Corn and Barley in Golestan Province	3
4	Effect of Ionizing Radiation on Quality and Contamination of Dried Barberry	4
5	Determining the Effect of Different Packaging Methods on the Organoleptic and Microbial Quality of Asparagus During Shelf Life	5
6	Producing and Evaluation of Functional Drink (Cacao Milk) with Flaxseed Powder and Stevia Sweetener	6
7	Study on Effect of Moisture Content on The Physicomechanical Properties of Cottonseed Varieties	7
8	The Extraction of Chlorophyll Pigment and Its Derivatives from Medicinal Plant Waste, Microencapsulation and its Application in Food Model Systems	8
9	Study of Modified Atmosphere Packaging on Walnut Kernel During Storage	9
10	Effect of Temperature and Relative Humidity on Garlic Powder Stability	10
11	Study of Eimen-Jav Solution Effect on Quality and Shelf Life of Strawberry Fruit	11
12	Evaluation of The Effect of Eimen-Jav Solution and Antimicrobial Film on Quality and Shelf Life of Orange Fruit	12
13	Optimization of Quality and Baking Properties of Flours With Different Extraction Rate by Enzymes and Emulsifiers	13
14	Investigating the Possibility of Using Whey in The Production of Fermented Vegetables	14
15	Effect of Ozone on Shelf Life and Quality Characteristics of Wheat and Rice in the Golestan Province	15
16	Investigation of Quality Improvement Strategies of Whole Meal Flour and Proper Use of Guar Gum and Bakery Improver in the Production of Lavash Bread	17
17	Possibility of Use of <i>Glycyrrhiza Glabra</i> in Production of Fruit Pastille and Determination its Textural and Sensory Properties	18
18	Effect of Cultivar and Harvesting Date on Quantity & Quality Characteristics & Shelf Life Assessment of Verjuice in Fars Province	19

Study on Methodology of Creating Original Geographical Quality Indication for Agri-Based Products in Iran

K. Rashmekarim*, R. Famil-Momen and S. Pardiskian
E-mail: dir@ati-group.ir

Abstract

A Geographical Indication (GI) is a name or sign used on products which corresponds to a specific geographical location or origin. Using Geographical Indication, as a confirmation for source, acts as a certification that the product possesses certain qualities. For finding the official responsibility of granting through of this indication and also the best methodology to use this mark as support to Farmers, agriculture systems and also quality of the products. The methodology in focal point countries (e.g. Italy, France) were studied and also by doing a survey we find out about the necessity of this sign in food market. Bone-Structures of responsible organizations, authorities, target food products, priorities of the products for having this mark, determinative parameters for foods acceptance, standards and details for quality control & people ideas about the necessity of this indication were studied. Analyzing the results from filled questioners showed positive ideas for all the 6 defined questions (1-protecting from fake products 2-Good reputation of goods 3-increasing the customers 4-acceptance of more expensive price 5-trust to the products quality 6-preventing from illegal usage of the name and reputation) with 95% significance and the article regarding trust to the products had the most highest acceptance and meanwhile raising price approval had the lowest rate according to the end consumers.

Keywords: Geographical Indication, Mark, Methodology, Product, Quality

AERI

Survey on Creation of Research & Innovation Network of SMEs of Wheat Value Chain

K. Rashmekarim*, H. Fatemian and S. Pardiskian
E-mail: dir@ati-group.ir

Abstract

Study on possibility of establishing a private network between small & medium size food firms for research and innovation in Iran. While we studied the history of these kinds of networks in the world with a survey based on filling up questioner by SMEs along with wheat based products value chain (about 630 entity), we find about 239 appropriate questioner for analyzing the results. Everybody replied to 37 question for evaluating 8 impact factor in industries activities. Impact result for starting network was evaluated by different questions and the analyzed as follow. Interest to participation in network of firms was significant ($P \leq 0.05$). They all agreed that the capacity and skills of labor force would be higher by this network ($P \leq 0.05$). For supply chain efficiency they had positive significant response ($P \leq 0.05$). Market demand for products of the firms would increase according to their idea ($P \leq 0.05$). They significantly agree that their marketing ability would increase by this network ($P \leq 0.05$). All the participants were agreed that the network will help them to establish a better infra-structure for their business ($P \leq 0.05$). According to their ideas by a network they can organize they better ($P \leq 0.05$). Relationship with government based on network would be in higher level and more effective and also competition with company out of network and synergy in cooperation with network companies would be much more ($P \leq 0.05$).

Keywords: Network, SMEs, Value Chain

AERI

Effect of Ozone on Quality Characteristics and Shelf Life of Corn and Barley in Golestan Province

J. Mohammadzadeh* and A. Chodsevali
E-mail: jmohammadzadeh@yahoo.com

Abstract

Corn and barley were ranked second and fourth among the cereals, and due to their beneficial and nutritious properties their consumption is increasing in most countries of the world. Most of these cereals are usually not used immediately after harvest, they are stored for gradual use in other seasons or for export to other areas. In areas with high relative humidity, growth of fungi and subsequently producing mycotoxins and storage pests, causing quantitative and qualitative damage to stored products, increasing waste and endangering community health. In order to replace the new and risk-free methods to extend the shelf life of cereals (instead of chemical pesticides), the use of ozone gas in corn and barley storage has been suggested. Therefore, in this study, the effect of ozone gas with two variables of ozone concentration (25, 50 and 75 ppm) on ozonation time (1, 3, 5 and 7 days) in corn (Single Cross 407 cultivar) and barley (Reyhaneh cultivar) were compared with the control sample. Statistical analysis was performed using factorial method in a completely randomized design with storage characteristics of corn and barley in terms of control of fungal, insect's growth, germination power and changes in grains quality characteristics. The results showed that the effects of ozone concentration, ozonation time and their interaction on storage and quality characteristics of barley and corn grains were significant. Increased ozone concentration and ozonation time increased control of fungal growth, spread of fungal toxins (aflatoxins) and increased effect of ozone on storage pests grains, but mean comparison test showed that this increase was not significant at concentrations greater than 50 ppm and 3 days ozonation time in both grains ($P < 0.05$). The results showed that application of 75 ppm ozone at 1, 3, 5 and 7 days caused significant oxidative changes compared to the control in fat (acidity and peroxide) and starch (carboxyl index) barley and corn. Also, different ozonation conditions up to 50 ppm concentration and all time had no significant effect on protein content in barley and corn compared to control ($P < 0.05$). The results of seed germination evaluation showed no significant decrease in seed germination at 50 ppm concentration up to 5 days of ozonation compared to control. Ozonation at 75 ppm and at 7 days compared to the control sample reduced germination to 31.5 and 35.6% in barley and corn, respectively. Therefore, based on the results, it was suggested to use ozone concentration of 50 ppm for 3 days of ozonation for storage of barley and corn grains.

Key words: Ozonation, Quality of storage properties, Germination, Barley, Corn

Effect of Ionizing Radiation on Quality and Contamination of Dried Barberry

N. Bidely*, S. Berenji Ardestani, Z. Shaikhhol-eslami and M. Saihoon
E-mail: nbidely45@yahoo.com

Abstract

The aim of this study was to compare the effects of gamma irradiation on dried barberry fruit to preserve quality aspects, reduce microbial contamination and insect growth during storage by chemical method (pre-treatment immersion in osmotic solution) and physical freezing method. For this purpose, in the month of "Aban", fresh barberry fruit was harvested in Mahmooii village in Birjand, Iran, using "Cutting Branches" and "Cluster Loss" methods. Barberry fruit harvested with "Cutting Branches" method was dried in shade and ambient-temperature of the village in a cellar called "Bargah". Fruit that was collected with "Cluster Loss" method was sun-dried on a clean fabric outside on the ground in ambient-temperature. In this study, like the traditional local pattern, in the "Branch-Drying" method of barberry the product is called "pufaki". The product of the "Cluster Loss" method after being Sun-dried is called "Dane Anari". In all tables and charts, the variable "Barberry drying method" is indicated as "Barberry type". Chemical, microbial, physical and Percentage of pest infestation tests were performed on samples in two zero and six months. At first, Immersion in osmotic solution (1g/L salt +3 g/L sodium meta bi sulfite +3 g/L citric acid +40 g/L sugar) on both fresh barberry samples: "pufaky" and "Dane Anari" was performed and Samples had been placed under normal atmospheric conditions until drying. Other treatments (freeze pasteurization and gamma irradiation) were performed on barberry after drying. In order to prepare the samples, two types of harvesting methods dried barberry was packed and coded in two polyamide films using (10 and 30 g) for microbial and chemical tests Respectively. Then the samples were transferred to the "Institute for Radiation Usage" at the Iranian Atomic Energy Agency's Nuclear Science and Technology Research Institute in Tehran and were subjected to gamma irradiation with cobalt source 60 at doses of 0, 3, 5 and 10 kGy. The samples were then stored at 25°C and 4°C to determine the shelf life of products. All mentioned tests was determined after six months and the results were statistically analyzed. The effect of gamma irradiation on different doses, osmotic and freezing process in terms of microbial load, chemical characteristics, sensory evaluation and Percentage of pest infestation were compared to control and barberry type "Pufaki" that was gamma irradiated at: 5 kGy dose (greater than 3kGy) was declared as the optimum processing method for dry barberry storage for 6 months at 4°C.

Key Word: Contamination, Dry barberry, Gama Radiation, Quality

AERI

Determining the Effect of Different Packaging Methods on the Organoleptic and Microbial Quality of Asparagus during Shelf Life

N. Sedaghatnia*, N. Zarifinia and B. Tajeddin
E-mail: nsedaghatnia@yahoo.com

Abstract

In order to investigate product conditions during storage and optimization of green asparagus storage conditions, a research was carried out as a joint collaboration between The Safi Abad Agricultural and Natural Resources Research and Education Center and The Shahid Rajaie Dezful Agriculture and Technology Company. This study was conducted in 5 experimental treatments, using Response Surface Methodology and in the form of a central composite design using Design Expert 8 software. Treatments in this experiment were included: unpurified sample packaging (asparagus) in wooden boxes or cardboard cartons; packaging water-tap sample in tap water in polyethylene bag; packaging samples of ozone-containing water in polyethylene bag; packing of samples washed with tap water with an ethylene absorbent sachet in polyethylene bag as well as packaging of ozone-washed sample with sachet of ethylene in polyethylene sack. Optimum conditions for product storage and degree of desirability of the proposed model were obtained after 15 days of storage and chemical and microbial tests. According to the results of the experiments, the use of ozone in the washing water and ethylene adsorbent sachet in packaging with 0.99 was generally the most suitable and desirable condition for green asparagus storage.

Keywords: Desirability, Green Asparagus, Packaging, Storage Time

AERI

Producing and Evaluation of Functional Drink (Cacao Milk) with Flaxseed Powder and Stevia Sweetener

P. Sharayei*, H. Rashidi and H. Behmadi
E-mail: parvin_sharayei@yahoo.com

Abstract

Today, the production and use of functional foods and beverages is on the rise. The purpose of this study was to produce high-fiber functional drink with low-calorie sweetener. To this end, the effects of flaxseed powder (2, 4 and 6%), stevia in three sucrose substituted concentrations (0, 50 and 100%) and sonication time (5, 10 and 15 minutes) on physicochemical, microbial and sensory evaluation of beverages cocoa -flaxseed milk was determined by the response surface with the box benkon design. The results of statistical analysis showed that with increasing the percentage of flaxseed, pH decreased and acidity, sedimentation, density and viscosity increased significantly ($P < 0.01$), while under these conditions the color parameters including a^* , b^* , and L^* showed significant improvement. Stevia's effect on physicochemical properties was significant ($P < 0.01$). The increase in ultrasound reduced viscosity of samples and improved their flow behavior characteristics. The best cocoa-flaxseed milk formulations were obtained when flaxseed was 2.5%, stevia 1%, and 14 min. At the optimum conditions pH 6.23, acidity of 0.322% lactic acid, density of 1.035 kg / m³, sedimentation rate of 0.788%, viscosity of 1.440 mpas, L^* parameter of 47.983 and overall acceptance of 4.77 was obtained. In the optimum sample, peroxide content increased over 14 days but was below the standard level. The overall count of microbial counting, mold and yeast and enterobacteriaceae bacteria in this sample after 14 days of storage at 4 °C were in the range of Iranian National Standard.

Keywords: Cocoa Milk, Flaxseed, Functional Drink, Sonication, Stevia

AERI

Study on Effect of Moisture Content on the Physicomechanical Properties of Cottonseed Varieties

A.Ghodsvali*, S. Nowrozieh, A. Safarnezhad, M.Adibi and Y. Aboomardani
Email: qodsevali@yahoo.com

Abstract

In this research, the geometrical properties included length, width, thickness, arithmetic and geometrical mean diameter, surface area, projected area and sphericity coefficient; gravimetric properties included thousand seed mass, volume, true and bulk density, and porosity; and static frictional properties included emptying and filling angle of repose, static coefficient of friction against structural surfaces wood, aluminium, glass and galvanized iron of seven cotton variety seeds (Khorshid, Sajedi, Golestan, Shaian, Kashmar, Latif and Varamin); and the effect of moisture content on them were investigated. A 7×4 (seven levels of variety and four levels of moisture content) Completely Randomized experimental Design (CRD) with five replications was carried out. The effect of variety on all of the physical properties of cotton seeds investigated except volume was significant ($P<0.01$, $P<0.05$). Khorshid and Varamin varieties significantly ($P<0.01$) had maximum length (without significant differences with each other 9.62 and 9.58 mm, respectively); Khorshid and Latif varieties significantly ($P<0.01$) had maximum width (without significant differences between own 5.43 and 5.40 mm, respectively); Khorshid variety significantly ($P<0.01$) had maximum thickness (4.68 mm), arithmetic and geometrical mean diameter (6.58 and 6.24 mm, respectively), surface area (1.23 cm²) and projected area (57.08 cm²); and Kashmar, Sajedi and Latif significantly ($P<0.01$) had maximum sphericity coefficient (without significant differences with each other 65.73%, 65.58% and 65.42%, respectively). The moisture content had significant effect ($P<0.01$, $P<0.05$) on all of the physical properties of cotton seeds investigated except emptying and filling angle of repose. Varamin, Khorshid and Golestan varieties significantly ($P<0.01$) had maximum porosity 59.2%, 57.1% and 55.9%, respectively without significant differences with each other. For showing of changes of physicomechanical properties investigated with increasing of moisture content, the first order regression equations with high coefficient of determination (R^2) were fitted except for length, width, thickness, arithmetic and geometrical mean diameter, surface area, projected area and sphericity coefficient of Latif variety; and emptying and filling angle of repose of Kashmar variety cotton seed showed higher coefficient of determination (R^2). Static coefficient of friction against various structural surfaces of cotton seeds investigated showed linear increasing with increasing of moisture content and first order regression equations with high coefficient of determination (R^2) were obtained.

Key words: Cotton Seed, Geometrical Properties, Gravimetric Properties, Static Frictional Properties, Moisture Content

AERI

The Extraction of Chlorophyll Pigment and its Derivatives from Medicinal Plant Waste, Microencapsulation and its Application in Food Model Systems

S. Einafshar* and P. Sharayei
E-mail: soodabeheyn@gmail.com

Abstract

This project was carried out in three phases to investigate the type and amount of dye compounds present in medicinal plant processing waste. In the first phase, the amount of chlorophyll and pheophytin present in the aquatic and vegetable contents of medicinal plants such as nettle, peppermint and conifer was measured from the processing plants. The results showed that the highest amount of chlorophyll and pheophytin was found in nettle plant waste. Therefore, extract of nettle plant was extracted by solvent extraction method. Different extraction methods showed that it was a useful tool in modeling the effect of color composition extraction conditions. The optimum solvent extraction conditions based on Box-Bench scheme were the response ratio of solvent to raw material 33:67, 100% solvent concentration, 7 h extraction time, and 25 min extraction temperature and 32 ° C. Under optimum conditions of extraction efficiency of 7.99%, chlorophyll and pheophytin levels were 54.75% and 341.54 mg / 100g, respectively. The proposed models had high coefficient of determination and coefficient of adjustment, nonsignificance weakness test and low variability coefficients indicating the efficiency of the presented models in predicting the evaluated parameters. The effect of two walls of maltodextrin and polyvinylpyrrolidone on the physicochemical properties of micronutrients was investigated. The results of physicochemical evaluation of the prepared microcapsules indicated that the effect of wall type, relative humidity percentage, ambient temperature and storage time on release rate of the effective extracts were significant. The amount of dye, chlorophyll and pheophytin in the maltodextrin wall was 74.41% and polyvinylpyrrolidone 78.72%, respectively. Also, the glass transition temperature of the microcapsules with maltodextrin wall material was about 82 ° C which was higher than ambient temperature. Therefore, these microcapsules will soften at ambient temperature later. Scanning electron microscopy images showed that the microcapsules containing maltodextrin had a smoother, spherical surface with fewer folds and wrinkles than the microcapsules prepared with polyvinylpyrrolidone. The polyvinylpyrrolidone containing wrinkles were higher and deeper cavities. Monitoring the amount of dye compounds in the nettle extract over 21 days of storage under different temperature and humidity conditions showed that the release rate increased with increasing temperature and relative humidity (coefficient of determination was greater than 0.90). The microcapsules prepared by combining the maltodextrin wall had a higher performance than the other wall in maintaining the structural properties and reducing the amount of dye compounds. The results of stability assessment of microcapsules in food model systems showed that the stability of microcapsules in environments containing oxidizing compounds such as ascorbic acid and reducing agents such as H₂O₂ was highest and lowest, respectively.

Keywords: Chlorophyll, Effective Material Extraction Yield, Microencapsulation, Pheophytin, Stability of Microcapsules

Study of Modified Atmosphere Packaging on Walnut Kernel during Storage

F. Salagegheh*, B. Tajeddin, A. Afzaligroh, H. Afzaligroh, N. Solamani, Z. Rafeei and M. Alimohamadi Badamoeyah
E-mail: fereshteh683@yahoo.com

Abstract

Walnut is considered as one of the most important dried fruits in terms of nutritional value like unsaturated fatty acids. The aim of this study was to investigate the effect of Modified atmosphere Packaging on the beneficial compounds in the kernel of walnut. Therefore, the genotypes 25 and 29 of walnuts were evaluated in terms of amount of aflatoxin at harvest time, and peroxide index, iodine number, acid number, sensory evaluation and quantitative and qualitative composition of fatty acids during one year storage. The results showed that unsaturated fatty acids predominate in walnut oil and the predominant fatty acid is linoleic acid. The percentage of saturated fatty acids was less than 10%. The level of aflatoxin in genotype 25 and 29 was zero and 5 ppb, respectively. The changes in the peroxide index of walnut samples were about 1.55-5.15 during storage time. The moisture of samples varied from 2.46 to 4.65%. The highest level of acidity was observed in the genotypes 25. With increasing the days of storage, the peroxide index, the titratable acidity (TA), and weight lost increased but the iodine value decreased. According to the experiments conducted, the packaged samples of genotype 25 in 5-layer films by a modified atmosphere (5-6% O₂, 15% CO₂ and 79-80% N₂ gases) are recommended due to lack of aflatoxin, and proper chemical and organoleptic properties.

Keywords: Chemical Properties, Organoleptic Properties, Modified Atmosphere Packaging, Polypropylene, Walnut Kernel

AERI

Effect of Temperature and Relative Humidity on Garlic Powder Stability

F. Bayat*, F. Badii, J. Soori, S. Maadani, and N. Bayanati
E-mail: f_bayat52@yahoo.com

Abstract

One of the important issues in the production of powders is the proper conditions for their packaging and storage to avoid any chemical and physical changes caused by stickiness. For this purpose, to predict the shelf life of garlic powder such indices as critical moisture content, i.e. the amount of moisture at the beginning of stickiness, the permeability of the packing material and the storage temperature and relative humidity was investigated. The 2 mm white garlic slices were dried at 60 ± 1 °C and some physical and chemical properties including pyruvate, color, moisture absorption and solubility of the garlic powder were measured. The Specific weight of powder, inside cylindrical PET (polyethylene terephthalate) packages with a height of 115 mm and a diameter of 45 mm under different temperature including 5, 15, 25, 35 and 45 °C and relative humidity at 32.2, 54.2, 75.2, and 95.2% were maintained until stickiness. The results showed that garlic powder became sticky at critical moisture content higher than 8.76% and increasing the moisture content of garlic powder decreased its sticky point temperature during storage. The isothermal curves showed that at constant water activity and at 5, 15 and 25 °C, the equilibrium moisture content increased with increasing temperature but decreased at 35 and 45 °C. The stickiness of garlic powder increased significantly with increasing temperature, relative humidity and storage time. Increasing relative humidity of garlic powder by more than 54 ± 2 % and increasing temperature by more than 25 °C changed garlic powder color but had no significant effect on total pyruvate content. Garlic powder self-life at temperatures less than 35 °C and relative humidity less than 54 ± 2 % was 300 days. Due to the permeability of 6.2×10^{-7} kg/m²/Pascal packing material, the prediction of shelf life of garlic powder was closer to the actual shelf life at 75% and 95% relative humidity.

Keywords: Isotherm, Packaging, Solubility, Stickiness, Storage

AERI

Study of Eimen-Jav Solution Effect on Quality and Shelf Life of Strawberry Fruit

A. Golshan Tafti*, A. Mirmajidi Hashtjin, S. Pardiskian, S. Madani, N. Keshavarz Komsari, B. Mohammadi and Z. Meghnatisi
E-mail:Golshan_ta@yahoo.com

Abstract

In this study, the efficacy of zinc oxide solution, with Eimen Jav's brand name, was investigated on quality and postharvest life of Camarosa strawberry cultivar. Strawberry fruits were dipped in Eimen Jav solution at different concentrations (0.31%, 0.63%, 0.94%, and 1.25%) for 1, 2 and 3 minutes. The fruits were then packed in fruit boxes and stored at room temperature (25 °C) and cold room (4 °C, 85-90% RH). Results indicated the beneficial effect of Eimen Jav solution on the quality of postharvest and the shelf life of strawberry fruits. Eimen Jav solution at concentration of 0.31% for 3 minutes maintained the quality and increased the shelf life of strawberry fruits up to 2 weeks in cold room. Compared to the control sample, this treatment reduced fungal decay by up to 50%. Eimen Jav solution improved the shelf life of strawberry fruits up to 48 hours at room temperature at a concentration of 0.63% for 3 minutes. In this condition, fungal decay the relative to control sample decreased by up to 70%. Eimen Jav solution effect on the fruit sensory attributes was not distinguishable and there was no significant difference ($p < 0.05$) among the treatments.

Keywords: Camarosa Cultivar, Eimen-Jav Solution, Shelf Life, Strawberry



AERI

Evaluation of the Effect of Eimen-Jav Solution and Antimicrobial Film on Quality and Shelf Life of Orange Fruit

A. Golshan Tafti*, S. Pardis Kian, Z. Rafiei, M. Faghihnasiri, N. Keshavarz Komsari, B. Mohammadi and Z. Meghnatisi
E-mail:Golshan_ta@yahoo.com

Abstract

The purpose of this study was to evaluate the effectiveness of Zinc Oxide solution (the Eimen Jav brand) and antimicrobial polyethylene coating on quality and postharvest life of orange cultivar Thomson navel. In this regard, the effect of different concentrations of Eimen Jav solution (3, 5 and 7%), immersion time (2.5, 5 and 7.5 minutes) and storage time on refrigeration conditions (6°C, RH=85-90%) on shelf life and physicochemical, and organoleptic characteristics of orange fruit were evaluated. In addition, the effect of coating type (conventional and antimicrobial polyethylene bags) was investigated. The results showed that the rate of decay of orange fruits treated with Eimen Jav solution decreased by about 30% at 3% concentration and 2.5 min immersion time. By packing oranges in ordinary and antimicrobial coatings and keeping them in cold storage, the percentage of weight loss was significantly lower than that of the control sample ($P < 0.01$). Taste index of packaged samples in the antimicrobial coating were significantly better than the control. There was no significant difference between vitamin C content of the packaged and control samples. Among the sensory characteristics, the appearance of the packaged samples was significantly better than the control.

Keywords: Antibacterial, Eimen-Jav Solution, Orange, Thomson Navel Cultivar, Packaging

AERI

Optimization of Quality and Baking Properties of Flours with Different Extraction Rate by Enzymes and Emulsifiers

Z. Sheikholeslami*, M. Karimi, M. Ghiafeh-davoodi and M. Mahfouzi
E-mail: shivasheikholeslami@yahoo.com

Abstract

In this study, three levels of flour extraction rate (80, 88 and 96 %), enzymes (amylase and xylanase) and emulsifiers (SSL and datem) (50ppm) were used in barbari bread. The moisture, specific volume, porosity, firmness (2, 24 and 72 hours after baking), crust color and sensory properties of breads (Barbari and Taftoon) were evaluated. The result showed, the moisture and a^* value were increased and firmness (during 72 hours) and L^* value were decreased by increasing flour extraction rate. The sample containing 80% extraction rate and amylase, xylanase, SSL and datem had the highest specific volume and porosity. Amylase and xylanase had the positive effect on texture, specific volume, porosity and sensory properties of bread. The flour extraction rate and enzymes didn't have significant effect ($P < 0.05$) on b^* value of samples. Finally, the evaluation of sensory properties showed the samples containing 80 and 88 % extraction rate, enzymes and emulsifiers had the highest overall acceptability.

Keywords: Flour Extraction Rate, Enzyme, Emulsifier, Flat Bread, Image Processing, Sensory Evaluation

AERI

Investigating the Possibility of Using Whey in the Production of Fermented Vegetables

L. Behbahani*, A. Azizi, M.R. Eslahi and A. Kardooni
E-mail:Leila_behbahani@yahoo.com

Abstract

Fermentation of vegetables and fruits is a traditional preservation technique. Although usually spontaneous fermentation processes are applied, the addition of lactic acid bacteria (LAB) starter cultures could accelerate processing and improve the consistency and quality of the end-products. In this study, by using whey as a starter containing lactic acid bacteria and three vegetables cauliflower, carrot and celery with/without tomato juice and also the 3 different salt concentrations, including 0, 3 and 5 percent, 3 treatments whey concentrations, including 0, 1 and 2 percent were produced. After 0, 5, 10, 15 and 20 days of starting fermentation, chemical test were performed to measure pH, acidity, vitamin C, firmness of tissue, activity of lactic acid bacteria and organoleptic properties. In both methods, all treatments increased pH with decreasing acidity, However, in treatments contained whey were observed decreased pH and consequently increased acidity, ascorbic acid, improved and accelerated fermentation process. All measuring statistical analysis were done by means of MSTATC software and variance analysis procedure and Duncan classification ($p < 0.05$, 0.01). According to tests carried out, the salty simple fermentation, samples containing 3 percent salt and 1% whey and salty fermented with tomato juice 5% salt and 2% whey is introduced, as well as the results of tests of chemical and physical and both are highly desirable sensory evaluations.

Key words: Fermentation, Tomato Juice, Vegetables, Whey

AERI

Effect of Ozone on Shelf Life and Quality Characteristics of Wheat and Rice in the Golestan Province

A. Ghodsvali*, A.Safarnezhad, M.Adibi and Y. Aboomardani
E-mail:qodsevali@yahoo.com

Abstract

In this research, the effects of ozone gas concentration and exposure time on some characteristics of rice grain var. Fajr included cooking time, solid material content (solid loss), water absorption, amylase content, weight of boiled rice, cooked grain elongation, gelatinization temperature, cubical expansion, fungal contamination and aflatoxin content, as well as wheat grain Var. Morvarid characteristics included germination energy, zeleny number, fat content, acidity and peroxide value, fungal contamination and aflatoxin content for a period of four months were investigated. The experiment was set up as split-plot arrangement in Completely Randomized Design with three replications. The main plots consisted of four levels of ozone gas concentration (0, 25, 50 and 75 ppm) treatments. The subplots consisted of four levels of exposure time (1, 3, 5 and 7 days). The results of this research showed that ozone gas concentration had significant effect ($p < 0.01$) on all cooking characteristics of rice grain except cubical expansion, cooked grain elongation, cooking time, gelatinization temperature and amylose content so that maximum weight of boiled rice (13.12 g), water absorption (8.12 g), solid material content (solid loss) (0.59 g), cooked grain elongation (1.428) (with significant differences ($p < 0.05$)) were in concentrations of 50, 50, 50 and 0 ppm, respectively, and regarding to cooking time (11.71 min), gelatinization temperature (2.63) and amylose content (23.24%) (Without significant differences ($p < 0.05$)) were in concentrations of 50, 75 and 25 ppm, respectively. Cubical expansion ($p < 0.05$), solid material content (solid loss) and amylose content ($p < 0.01$) were under significant effect of exposure time so that maximum cubical expansion (4.16), solid loss (0.613 g) and amylose content (24.80%) occurred in 1, 3 and 1 days, respectively. The results showed that minimum fungal contamination (97.5 colony/g) and its maximum (1400.0 colony/g) were observed at concentration of 75 and 0 ppm (with significant differences ($p < 0.05$)), respectively and maximum aflatoxin production (11.15 $\mu\text{g/g}$) and its minimum (Not detectable) observed at concentration of 0 and 50, 75 ppm (with significant differences ($p < 0.05$)), respectively. The results of this research showed that minimum fungal contamination (469.2 colony/g) and its maximum (699.2 colony/g) were observed at exposure time of 7 and 1 days (with significant differences ($p < 0.05$)), respectively and maximum aflatoxin production (8.42 $\mu\text{g/g}$) and its minimum (5.69 $\mu\text{g/g}$) observed at exposure time of 1 and 7 days (with significant differences ($p < 0.05$)), respectively. The results showed that minimum fungal contamination (76.7 colony/g) and its maximum (1433.3 colony/g) were observed when applied concentration of 75 ppmv and exposure time 7 days, and 0 ppm and 7 days (with significant differences ($p < 0.05$)), respectively and maximum aflatoxin production (12.07 $\mu\text{g/g}$) and its minimum (Not detectable) were observed concentration of 0 ppm and exposure time 1 days, and 75 ppm and 7 days (with significant differences ($p < 0.05$)), respectively. Analysis of variance showed that ozone gas concentration and exposure time treatments and their interaction had

significant effect ($p < 0.01$) on germination energy and chemical characteristics (zeleny sedimentation) of wheat grain. Minimum germination energy (94%) and its maximum (99%) were observed at concentration of 0 and 25 ppmv (with significant differences ($p < 0.05$)), respectively and maximum zeleny sedimentation (34.19 mm) and its minimum (30.16 mm) observed at concentration of 50 and 0 ppmv (with significant differences ($p < 0.05$)), respectively. The results of this research showed that regarding to significant ($p < 0.01$) effect of exposure time on germination energy, its maximum (100%) with applying 5 days was 4.2% higher as compared to minimum value (96%) with applying 3 days. Increasing of exposure time led to significant ($p < 0.01$) reduction of zeleny value so that with increasing of 3 days (without significant differences with 1 and 5 days, 32.72 mm) to 7 days (minimum value, 32.15 mm), reduction of 1.7% was observed. The results showed that increasing of gas concentration alongside exposure time had significant ($p < 0.01$) effect on zeleny value so that higher concentration with lower time led to significant ($p < 0.01$) increasing of zeleny value and concentration of 75 ppm for exposure time of 1 day which had maximum value (35.03 mm), was 16.8% higher as compared to minimum value (30.00 mm) due to control samples. The results showed that increasing of gas concentration led to significant ($p < 0.01$) reduction of wheat grain fungal contamination and aflatoxin production. Minimum fungal contamination (88.3 colony/g) and its maximum (2725.0 colony/g) were observed at concentration of 75 and 0 ppmv (with significant differences ($p < 0.05$)), respectively and maximum aflatoxin production (14.96 $\mu\text{g/g}$) and its minimum (Not detectable) were observed at concentration of 0 and 75 ppm (with significant differences ($p < 0.05$)), respectively. Minimum fungal contamination (833.3 colony/g) and its maximum (1294.2 colony/g) were observed at exposure time of 7 and 1 days (with significant differences ($p < 0.05$)), respectively and maximum aflatoxin production (9.84 $\mu\text{g/g}$) and its minimum (8.17 $\mu\text{g/g}$) were observed at exposure time of 1 and 7 days (with significant differences ($p < 0.05$)), respectively. Minimum fungal contamination (73.7 colony/g) and its maximum (2800.0 colony/g) were observed when applied concentration of 75 ppm and exposure time 7 days, as well as 0 ppm and 7 days (with significant differences ($p < 0.05$)), respectively and maximum aflatoxin production (15.11 $\mu\text{g/g}$) and its minimum (Not detectable) were observed concentration of 0 ppm and exposure time 1 days, and all concentration higher than 50 ppm and exposure time higher than 1 day (with significant differences ($p < 0.05$)), respectively. Therefore, it was recommended the usage ozone concentration of 50 ppm for 3 days of ozonation regarding to rice grain and 50 ppm for 5 days regarding to wheat grain storage.

Key Words: Cooking Characteristics, Ozon, Rice, Wheat, Zeleny Sedimentation

AERI

Investigation of Quality Improvement Strategies of Whole Meal Flour and Proper Use of Guar Gum and Bakery Improver in the Production of Lavash Bread

M. Karimi*, Z. Sheikholeslami and B. Sahraiyani
E-mail:mahdikarimi753@yahoo.com

Abstract

The aim of this study was investigation of quality improvement strategies and proper use of whole meal flour in the production of Lavash bread. For production of whole meal Lavash bread 4 types of formulations were designed and compared to common Lavash bread (flour with 78 % extraction rate). The second formula (flour with 93 %), the third formula (flour with 93 % extraction rate, 0.25% guar gum and 0.3% improver), the fourth formula (flour with 97 % extraction rate) and the fifth formula (flour with 97 % extraction rate, 0.25% guar gum and 0.3% improver) were used for whole meal Lavash bread. The first proof time for five formulations was variable. Baking temperature (400 C°) and time (1.5 min) were fixed. The proof time of first, second, third, fourth and fifth formula was 60, 55, 75, 50 and 70. The physicochemical of flour, farinograph and moisture, porosity, firmness, crust color and sensory properties were evaluated. The result showed samples were containing flour with 93 and 97 extraction rate had the highest phytic acid and fiber. Phytic acid was reduced during proof time. The samples containing guar gum and improver had the best stability, the highest sensory properties score and the lowest firmness. According to the results, the third and fifth formula were introduced a common formula of Lavash bread.

Keywords: Flour Extraction Rate, Improvement, Guar Gum, Proof, Farinograph

AERI

Possibility of Use of *Glycyrrhiza Glabra* in Production of Fruit Pastille and Determination its Textural and Sensory Properties

Sh. Basiri*, F. Gheybi and H. Saberian
E-mail:shbasiri35@yahoo.com

Abstract

Pastilles are a kind of soft candy. They contain hydrocolloids which are obtained by the solidification of a thick liquid. The aim of this project was to produce a kind of beneficial pastille containing licorice to use the valuable nutritional and medicinal properties. In this study, different amounts of agar (1, 2 and 3%) and glycyrrhizin acid (0.1, 0.5 and 1%) were used. Color indicators, texture and sensory characteristics of the finished products were evaluated. Results of the effect of treatments on the color parameters showed that the differences between samples were significant. As the agar increased, the color indexes of $L^* a^* b^*$ increased and the brightness, redness and yellowness of the samples increased. Evaluation of tissue properties showed that with increasing agar, stiffness, cohesiveness, chewiness and gumminess of the samples increased. Pastille sample with 3% agar and 1% glycyrrhizin acid had the highest stiffness (18555.5 N/m), cohesiveness (0.48), gumminess (7.6 N) and chewiness (0.026 Nm). The organoleptic results showed that the sensory properties of the samples were satisfied. Pastille with 2% agar and 0.5% glycyrrhizin acid was the best sample. Its stiffness, cohesiveness, chewiness and gumminess were minimal. It had good sensory properties. With the production of this pastille, it was possible to use the unique properties of licorice.

Key words: *Glycyrrhiza Glabra*, Medicinal Pastille, Organoleptic Characteristics, Texture Properties

AERI

Effect of Cultivar and Harvesting Date on Quantity & Quality Characteristics & Shelf Life Assessment of Verjuice in Fars province

M. Shahamirian*, M.J. Karami, N. Maftoonazad , A. Joukar and M. zareh
E-mail: shahamirian2008@gmail.com

Abstract

The main uses of grapes in Fars province are as fresh consumption and raisins. One of the most valuable products from unripe grape is Verjuice (abghore). Due to having useful antioxidant compounds and polyphenols, this product has many therapeutic properties. Identification of suitable cultivars and the best harvest date is very effective to obtain a high quality product and to develop the grape processing industry. In this study, three cultivars of unripe grape (Doshmanziyari, Kolee and Kondory) harvested in two different harvest dates and quantitative factors such as (Cluster length, Cluster width, average weight of each cluster, Cluster density, Cubic length, Cubic width, Cubic weight and fruit juice content) and qualitative characteristics (acidity, total soluble solids, pH, total phenol and color factors namely L*, a*, and b*) were measured. In the next step, the shelf-life of verjuices from different cultivars was evaluated at two different temperatures (4 and 25°C for one year and qualitative characteristics were measured at 3-month intervals. Finally, sensory tests were performed to compare different samples. Results showed that quantitative factors increased in the second harvest date, and the effects of cultivar, harvest date and the interaction between cultivar and harvest date were significant on fruit juice content, pH and total phenol ($p < 0.01$). The effect of cultivar and harvest date on acidity was highly significant ($p < 0.01$). Doshmanziyari had the highest amount of acidity and the highest content of phenol at the first and second harvest date; respectively. The highest and the lowest of a* value was observed in Doshmanziyari and Kondory; respectively. Results of shelf life studies demonstrated that changes in acidity, total phenol, L* and b* values followed a* decreasing trend while pH, total soluble solids and a* value increased during storage at two temperatures. Results of sensory analysis showed that the samples of Doshmanziyari scored the best for all sensorial parameters in both harvest dates at 4°C.

Key words: Color, Grape, Polyphenol, Shelf Life, Unripe Grape

AERI

