

**SELECTIVE DISSEMINATION OF INFORMATION (SDI)
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GENERAL

1-METHYLCYCLOPROPENE

Yu, Lina, et al. 2017. Sucrose degradation is regulated by 1-methylcyclopropene treatment and is related to chilling tolerance in two peach cultivars. *Postharvest Biol. & Technol. Tec.* 124: 25-34.

Abstract

In order to reveal how sucrose degradation is related to chilling tolerance, two varieties of peach fruit, 'Zajiao' and 'Yulu', were treated with 1-methylcyclopropene (1-MCP) vapor at 1 µL/L for 24h before storage at 5 °C for 35 and 28 d respectively. 'Yulu' peaches had higher sucrose content than 'Zajiao' peaches at harvest, but a higher rate of sucrose degradation in untreated 'Yulu' fruit may have resulted greater sensitivity to chilling stress compared with untreated 'Zajiao' fruit. 1-MCP treatment significantly inhibited chilling injury (CI) and preserved higher firmness values in both varieties. This treatment reduced the activities and expression of enzymes related to sucrose degradation, and increased activity and expression of sucrose synthase synthesis, resulting in a lower rate of sucrose degradation and the increase of glucose and fructose content in both varieties during cold storage. These results suggest that lower degradation rates of sucrose during cold stress, rather than the higher content of sucrose at harvest time, enhances chilling tolerance in peach fruit.

Keywords: /1-Methylcyclopropene/ /Chilling injury/

CHITOSAN

Ballester-Costa, Carmen, et al. 2016. Evaluation of the antibacterial and antioxidant activities of chitosan edible films incorporated with organic essential oils obtained from four *Thymus* species. *J Food Sci. Technol.* 53(8): 3374-3379.

Abstract

The aims of this study were to evaluate, (1) the antibacterial properties, (2) the total phenol content and (3) the antioxidant activity, of chitosan edible films incorporated with certified organic essential oils (EOs) obtained from *Thymus zygis*, *Thymus mastichina*, *Thymus capitatus* and *Thymus vulgaris*. The agar disc diffusion method was used to determine the antibacterial activities of chitosan edible films while for the antioxidant activity, two different analytical assays were used (DPPH and FRAP). As regard antibacterial activity, films containing only chitosan were not effective against any of tested bacteria. Chitosan films containing *T. capitatus* EO (CH + TCEO) was more effective against *Listeria innocua* and *Alcaligenes faecalis* whilst chitosan films containing *T. mastichina* EO (CH + TMEO) had the highest inhibition halos against *Serratia marcescens*. For and *Enterobacter amnigenus* no antibacterial activity was achieved. Chitosan films added with *Thymus* essential oils showed antioxidant activity, at all

concentrations and with all methods assayed. CH + TZEO had the highest antioxidant activity revealed with DPPH assay. However in CH + TCEO showed best antioxidant effect when assessed with FRAP assay. The results showed that chitosan edible films incorporated with organic Thymus EOs could be used as active films in food industry due to its antibacterial and antioxidant activities.

Keywords: /Chitosan/ /Edible Films/

COLD STORAGE

Wang, Chen and Xianjun Meng. 2016. Effect of ^{60}Co γ -irradiation on storage quality and cell wall ultra-structure of blueberry fruit during **cold storage**. *Innov Food Sci. Emerg.* 38: 91 - 97.

Abstract

In order to explore the influence rule of ^{60}Co γ -irradiation on preservation effect of blueberry fruit, this research used different doses to deal with "Bluecrop" blueberries. The experimental results indicated that: under the temperature of 0 ± 0.5 °C, the preservation effect of 0.5 kGy irradiation treatment on blueberry fruit was not obvious and 3.0 kGy irradiation treatment can accelerate the ageing process of blueberry fruit in late storage, so 1.0 kGy to 2.5 kGy irradiation treatment were considered to be a feasible method for reducing the fruit rot rate, maintaining fruit firmness and colour, and reducing the loss of nutrients in blueberry fruit during storage, among them, 2.5 kGy irradiation treatment had the best preservation effect on the blueberry fruit stored for 35 days, which fruit decay rate was the lowest (3.35%), fruit firmness was the highest (1.08 N), the degradation of nutrients was the most slowly, the pictures of cell-wall ultrastructure were relatively complete, and the storage period was effectively prolonged to 63 days. Industrial relevance: The appropriate doses of irradiation treatment are very efficient in reducing the decay rate, maintaining sensory and nutritional quality, and extending the storage period for blueberry fruit stored at 0 ± 0.5 °C.

Keywords: /Cold Storage/Irradiation/ /Blueberry/ /Storage quality

FOOD SAFETY

Adasme-Berríos, Christian, et al. 2016. Segmentation of consumer preference for **food safety** label on vegetables. *British Food J.* 118(10): 2550 –2566.

Abstract

Purpose : The purpose of this paper is to explore the differences in consumers' preferences to food safety label (FSL) on vegetables in central and south central Chile in terms of sociodemographic characteristics, consumers' food safety knowledge and frequency of vegetables consumption. **Design/methodology/approach:** A survey was applied to 1,201 consumers in charge of buying vegetables for their households. The questionnaire measured consumer preference for FSL using tomatoes as a case study. **Findings –** The most important attributes for consumers were price (57.3 percent), FSL (19.7 percent), point of sale (11.86 percent) and production system (11.07 percent). Cluster analysis was used to differentiate three types of consumers. The majority (50.5 percent) are consumers oriented to price of tomatoes more than other attributes. A second group (30.1 percent) considers it important to purchase tomatoes at the lowest price with the existence of a FSL. A minority (19.4 percent) was oriented to purchasing tomatoes with a FSL. The groups differ according to

sociodemographic characteristics, food safety knowledge and frequency of vegetables consumption. Research limitations/implications – The study was conducted in country in South America. The results revealed that the majority of consumers choose price over FSL. Nevertheless, a potential market niche was identified that was motivated by FSL as a potential risk-reduction strategy when making choices about fresh vegetables purchase. Practical implications – FSL is a marketing tool to help the consumers about food decisions. Social implications – To avoid problems associated to unsafe vegetables, FSL is used as a potential risk-reduction strategy when making choices about fresh vegetables purchase. Originality/value – The research provides information about a market niche of consumers interested in the existence of an explicit FSL, due to their awareness of the risks associated with the consumption of vegetables. This topic has received little research in Latin American developing countries.

Keywords: /Food Safety/ /Consumer Preference/ /Vegetables/

FOOD SECURITY

Gebre Mezgebe, Abadi, et al. 2016. Post-harvest losses and handling practices of durable and perishable crops produced in relation with **food security** of households in Ethiopia: secondary data analysis. J. Stored Prod. Res. 7(5): 45-52.

Abstract

This secondary data analysis was conducted to assess post-harvest losses and handling practices. The postharvest section of the Living Standard Measurement Survey (LSMS) data set of the Ethiopian Rural Socio-economic Survey (ERSS) was used as a data source. The analysis result showed losses of 153.29 kg of cereal crops (7.7% households), 120.16 kg of pulses (5.5% households), 320 kg of oilseeds (4.1% households), 102.19 kg of fruit crops (11% households), 181.86 kg of vegetable (8.2% households), 105.56 kg of root crops (5% households), and 556.13 kg of cash crops (8.2% households). Higher number of households (30%) lost 30% of fruits, 10% of vegetables (21.62% household), 50 and 60% of root and cash crops (26.5% households), respectively. The major cause for cereals and oilseeds loss was rodents/pests, others for pulses and diseases for the perishable crops. Additionally, 84% of the households stored cereal, 63.9% pulses, 80.9% oilseeds, 7.6% fruits, 16.6% vegetables, 25.7% roots and 29% cash crops. The main storage method of durable crops was bags in house and sacks for perishable crops. Furthermore, 91% of the households protected cereal crops, 59.97% pulses, 74.8% oilseeds, 78.4% fruits, 81.7% vegetables, 71% roots and 78.5% cash crops. The major technique used for protection of cereal, pulse, vegetable and cash crops was elevation, while other techniques were used for fruits and root crops. About 50.4% of households did not protect oilseeds. Postharvest losses varied among crop types and handling practices. Reduction of losses could contribute to food and nutritional security; hence attention should be given towards improving postharvest handling practices.

Keywords: /Food Security/ /Perishable Crops / /Postharvest Losses/ /Handling Practices/

MINIMALLY PROCESSED

Rodgers, Svetlana. 2016. **Minimally Processed** functional foods: technological and operational pathways. J. Food Sci. 81: 2309-2319.

Abstract

This paper offers a concise review of technical and operational concepts underpinning commercialization of minimally processed functional foods (FFs), foods with fresh-like qualities commanding premium prices. The growing number of permitted nutritional content/health claims, many of which relate to well-being, coupled with emerging extraction and food processing technologies offers new exciting opportunities for small and medium size enterprises(SMEs) specializing in fresh produce to play an active role in the health market. Supporting SMEs, governments could benefit from savings in healthcare costs and value creation in the economy. Consumers could benefit from novel FF formats such as refrigerated RTE (ready-to-eat) meals, a variety of fresh-like meat-, fish-, and egg-based products, fresh-cut fruits and vegetables, cereal-based fermented foods and beverages. To preserve these valuable commodities, mild biological(enzymatic treatment, fermentation and, bio-preservation) and engineering solutions are needed. The latter include nonthermal techniques such as high-pressure treatment, cook-chill, sous-vide, mirco-encapsulation, vacuum impregnation and others. “De-constructive” culinary techniques such as 3D food printing and molecular gastronomy as well as developments in nutrigenomics and digital technologies facilitate novel product formats, personalization and access toniche markets. In the operational sense, moving from nourishment to health improvement demands a shift from defensive market-oriented to offensive market-developing strategies including collaborative networks with research organizations.

Keywords: /Minimal processing/ /Nuritional Quality/ /Ready-to-eat/

MODIFIED ATMOSPHERE PACKAGING

Pinela, Jose, et al. 2016. **Modified atmosphere packaging** and post-packaging irradiation of *Rumexinduratus* leaves: a comparative study of postharvest quality changes. J. Food Sci. Technol. 53(7): 2943 - 2956.

Abstract

The effects of conventional and inert-gas enrichedatmospheres, as well as those caused by different irradiation doses, on buckler sorrel (*Rumexinduratus*)leaves quality were evaluated and compared after 12 days of storage at 4 °C. The green colour of the abaxial surface of the leaves was relatively stable, as well as the carbohydrates content and the calorific value. The storage time decreased the amounts of fructose, glucose, trehalose, a-tocopherol,and b-tocopherol and increased the levels of total organic acids and d-tocopherol. The total tocopherols content was higher in air-packaged non-irradiated leaves,antioxidant compounds that may have contributed to the preservation of polyunsaturated fatty acids (PUFA). Some antioxidant properties were also favoured during storage. It was found that the overall postharvest quality of buckler sorrel leaves is better maintained with the argon-enriched atmospheres, while the 6 kGy dose was a suitable option to preserve PUF+A during cold storage. This study highlights the suitability of the applied postharvest treatments and the interest to include buckler sorrel leaves in contemporary diets.

Keywords: /Modified Atmosphere Packaging/ /Gamma Irradiation/ /Cold Storage/ /Postharvest Quality/

PACKAGING

Lee, Dong Sun. 2016. Carbon dioxide absorbers for food **packaging** applications. Trends Food Sci. Technol. 57: 146 - 155.

Abstract

Background: Although CO₂ gas is useful for the modified-atmosphere packaging of foods, excess CO₂ accumulation in a package may be detrimental to the quality of the product and/or the integrity of the package, particularly in the case of CO₂ -producing foods, such as fermented foods and fresh produce. In those cases, including CO₂ scavengers in food packages is beneficial for preserving the food quality and package integrity. Scope and Approach: The common mechanisms that are exploited for CO₂ absorption in food packages are chemical reactions and physical adsorption. The CO₂ absorption capacity and absorption kinetics of chemical and physical absorbers were examined and reviewed with respect to their proper use in packages of CO₂ -producing foods. The applications of CO₂ scavengers in food packages were examined in terms of the benefits achieved and their efficacy. Key Findings and Conclusions: The CO₂ production characteristics and desired atmospheric conditions of foods must be established and tuned to the thermodynamic and kinetic properties of CO₂ absorbers sometimes in combination with the gas transfer behaviour of the package layer. The combined or synergistic use of CO₂ scavengers with other active packaging tools may be the direction for further research improving food quality preservation.

Keywords: /Fresh Produce/ /Modified Atmosphere/

Rundh, Bo. 2016. The role of **packaging** within marketing and value creation. Brit Food J. 118(10): 2491–2511.

Abstract

Purpose – The purpose of this paper is to explore the importance of innovative packaging for marketing purposes in a food supply chain. The intent is also to understand the function of packaging as a marketing tool. The outcome of the study is expected to contribute to the link between packaging and marketing literature. Design/methodology/approach – The case study method was chosen in order to assess and investigate how packaging can be used in marketing. The study focuses on narrating the use of packaging for different customer applications and the unit of analysis was the packaging product. In order to analyse the five sub-cases or “corporate stories” a cross-case analysis was used and the analysis of data was carried out in different stages. This approach treats each sub-case as a separate entity and the analysis reveals both similarities and differences among the sub-cases. Findings – The present study demonstrates that packaging has become an important tool in marketing of different products either this is for end-consumers, or customers in a supply chain. This has become more essential as more products are introduced on a market. The study shows the significance of linking packaging to marketing strategy. An important ingredient for that is the use of packaging design for differentiation purposes. The results support also that packaging has become an essential factor for a secure and efficient distribution in a food supply chain. In addition, packaging and packaging design is contributing to value creation for different actors in a food supply chain. Practical implications – The managerial implication from the case study shows that packaging can be used together with the product concept to create a competitive offering in a market. This gives managers the possibility to differentiate their products from competitive offerings by using packaging and packaging design in a creative manner. Originality/value –

This paper fulfils an identified need for contributions to more research on packaging and marketing strategy. The study shows the influence of packaging on marketing.

Keywords: /Marketing/ /Packaging/

REFRIGERATED STORAGE

Park, Shin Young, Sujin Kang and Sang-Do Ha. 2016. Antimicrobial effects of vinegar against norovirus and *Escherichia coli* in the traditional Korean vinegared green laver (*Enteromorpha intestinalis*) salad during **refrigerated storage**. Int'l. J. Food Microbiol. 238: 208 -214.

Abstract

In Korea, edible seaweeds are potentially regarded as high-risk foods with respect to enteric norovirus (NoV) and non-pathogenic generic *Escherichia coli*. This study investigated the antimicrobial effects of 5%, 10%, and 15% vinegar (6% acetic acid) on the survival of murine norovirus-1 (MNV-1), a human NoV surrogate, and *E. coli*, a fecal indicator in experimentally contaminated raw fresh green lavers (*Enteromorpha intestinalis*) during a 7-d storage period at 4 °C. Both MNV-1 titers and *E. coli* counts significantly ($p < 0.05$) decreased with stepwise increase in vinegar concentration and storage time, except in *E. coli* of the 0% vinegar-containing lavers; however, MNV-1 was more resistant to vinegar than *E. coli*. The overall average MNV-1 titers were significantly ($p < 0.05$) higher in 0% vinegar-containing lavers (3.6 log₁₀ PFU/ml) than in 5–15% vinegar-containing lavers (3.3–3.1 log₁₀ PFU/ml) throughout the 7 days of storage. A 1-log reduction in the MNV-1 titer was observed in 0% vinegar-containing laver samples after 5 days of storage and 5–15% vinegar-containing laver samples after 3 days of storage. The overall *E. coli* count was also significantly ($p < 0.05$) decreased in the 15% (6.8 log₁₀CFU/g) vinegar-containing lavers than in the 10% (7.3 log₁₀CFU/g) and 5% (7.6 log₁₀CFU/g) vinegar-containing lavers. A > 1-log reduction in the *E. coli* count was observed in 10–15% vinegar-containing laver samples just after 1 day of storage. A 2-log reduction in the *E. coli* count was also observed in 10–15% vinegar-containing laver samples after 5 days of storage. Using the non-linear Weibull model, this study showed that the d_r -values (1-log reduction) of MNV-1 were 4.90 days for 0%, 4.28 days for 5%, 3.79 days for 10%, and 2.88 days for 15% vinegar-containing lavers, whereas those for *E. coli* were 1.12 day for 5%, 1.03 day for 10%, and 0.90 day for 15% vinegar-containing lavers stored at 4 °C. Vinegar with over the storage time can be used as an antimicrobial ingredient against NoV and *E. coli* in Korean conventional foods. Specifically, this study suggests that ~1 day of storage is required for 1-log reduction in the *E. coli* count in the vinegar-containing (5–15%) lavers, whereas 3–5 days of storage at 4 °C is adequate for 1- log reduction in the MNV-1 count in the vinegar-containing and non-vinegar-containing lavers.

Keywords: /Refrigerated Storage/ /*E. coli*/ /Storage/

SUPPLY CHAIN

Manning, Louise and Jan Mei Soon. 2016. Development of sustainability indicator scoring (SIS) for the food **supply chain**. Brit Food J. 118(9): 2097 – 2125.

Abstract

Purpose – The purpose of this paper is to identify mechanisms for using a quantitative benchmarking approach to drive sustainability improvements in the food supply chain. Design/methodology/approach – A literature review was undertaken and then a strategic and operational framework developed for improving food supply chain sustainability in terms of triple bottom line criteria. Findings – Using a sustainability indicator scoring approach, the paper considers the architecture for analysis so that strategic goals can be clearly formulated and cascade into specific, relevant and Time bound strategic and operational measures that underpin brand value and product integrity. Originality/value – This paper is of value to academics and also practitioners in the food industry.

Keywords: /Supply Chain/

FRUITS

BANANA

Yuan, Yunfei, et al. 2017. Metabolomic analyses of **banana** during postharvest senescence by 1H-high resolution-NMR. Food Chem. 218: 406 - 412.

Abstract

Banana is a tropical fruit widely accepted by people over the world. Its chemical composition is critical for its organoleptic properties and nutritional value. In this work, the metabolite changes during postharvest senescence were investigated using NMR spectroscopy. The 1D and 2D NMR spectroscopic information revealed the primary and secondary metabolites in banana fruit, including organic acids, amino acids, carbohydrates and phenolics. Bananas at five senescence stages showed similar chemical profiles, but the levels of the individual compounds varied to a large extent. The principal metabolites responsible for postharvest senescence of banana were valine, alanine, aspartic acid, choline, acetate, glucose, malic acid, gallic acid and dopamine. At stage V, ethanol was present due to the conversion of glucose. Salsolinol was generated due to the conversion of dopamine. This was a characteristic marker for the postharvest senescence of banana fruit.

Keywords: /Banana/ /Senescence

BLUEBERRY

Moggia, Claudia, et al. 2016. Fruit characteristics and cuticle triterpenes as related to postharvest quality of highbush **blueberries**. Scientia Hort. 211: 449 - 457.

Abstract

Chilean fresh blueberries take 20–50 days to arrive by boat to the Northern hemisphere, softening and dehydration being the main defects upon arrival. The effect of maturity at harvest (75% blue, 100% blue, and overripe) on cuticular triterpene content, and the possible associated impacts on firmness and weight loss after cold storage were explored for 'Duke' and 'Brigitta' fruit, both non-bagged or bagged in macro-perforated low-density polyethylene bags. Softening and weight loss varied with cultivar and maturity stage: 'Duke' fruit softened faster and were more prone to dehydration than

'Brigitta' samples, whereas overripe fruit were less firm after storage. This is the first report characterizing the triterpenoid fraction in cuticles of fresh blueberries, which may play a role in their postharvest behavior. Weight loss and softening rates were highly correlated to ursolic acid contents at harvest; further research will be required for a better understanding of these relationships.

Keywords: /Blueberry/ /Firmness/

Siddiq, M. and K.D. Dolan. 2017. Characterization of polyphenol oxidase from **blueberry** (*Vaccinium corymbosum* L.). Food Chem. 218: 216 -220.

Abstract

Polyphenol oxidase (PPO) was extracted and characterized from high-bush blueberries. PPO showed an optimum activity at pH 6.1–6.3 and 35 °C, with the enzyme showing significant activity over a wide temperature range (25–60 °C). Catechol was the most readily oxidized substrate followed by 4-methylcatechol, DL-DOPA, and dopamine. Blueberry PPO showed a K_m of 15 mM and V_{max} of 2.57 DA420 nm/min $\times 10^{-1}$, determined with catechol. PPO was completely inactivated in 20 min at 85 °C, however, after 30 min at 75 °C it showed about 10% residual activity. Thermal treatment at 55 and 65 °C for 30 min resulted in the partial inactivation of PPO. Ascorbic acid, sodium diethyldithiocarbamic acid, L-cysteine, and sodium metabisulfite were effective inhibitors of PPO at 1.0 mM. Benzoic acid and cinnamic acid series inhibitors showed relatively weak inhibition of PPO (21.8–27.6%), even at as high as 2.0 mM concentration.

Keywords: /Blueberry/ /Polyphenol Oxidase/

CITRUS

Ballester, Ana-Rosa and María T. Lafuente. 2017. LED Blue Light-induced changes in phenolics and ethylene in **citrus** fruit: implication in elicited resistance against *Penicillium digitatum* infection. 218: 575-583.

Abstract

The objective was to investigate whether LED Blue Light (LBL) induces changes in phenolics and ethylene production of sweet oranges, and whether they participate in LBL-elicited resistance against the most important postharvest pathogen (*Penicillium digitatum*) of citrus fruit. The expression of relevant genes of the phenylpropanoid and ethylene biosynthetic pathways during elicitation of resistance was also determined. Different LBL (wavelength 450 nm) quantum fluxes were used within the 60–630 $\mu\text{mol m}^{-2} \text{s}^{-1}$ range. The HPLC analysis showed that the most relevant increase in phenylpropanoids occurred in scoparone, which markedly increased 3 days after exposing fruits to a very high quantum flux (630 $\mu\text{mol m}^{-2} \text{s}^{-1}$) for 18 h. However, phenylpropanoids, including scoparone, were not critical factors in LBL-induced resistance. The genes involved in ethylene biosynthesis were differentially regulated by LBL. Ethylene is not involved in elicited resistance, although high LBL levels increased ethylene production in only 1 h.

Keywords: /Citrus / /Postharvest Disease/

Cubero, Sergio, et al. 2016. Automated Systems Based on Machine Vision for Inspecting Citrus Fruits from the Field to Postharvest—a review. Food Bioprocess Technol. 9: 1623 - 1639.

Abstract

Computer vision systems are becoming a scientific but also a commercial tool for food quality assessment. In the field, these systems can be used to predict yield, as well as for robotic harvesting or the early detection of potentially dangerous diseases. In postharvest handling, it is mostly used for the automated inspection of the external quality of the fruits and for sorting them into commercial categories at very high speed. More recently, the use of hyperspectral imaging is allowing the detection of not only defects in the skin of the fruits but also their association to certain diseases of particular importance. In the research works that use this technology, wavelengths that play a significant role in detecting some of these dangerous diseases are found, leading to the development of multispectral imaging systems that can be used in industry. This article reviews recent works that use colour and non-standard computer vision systems for the automated inspection of citrus. It explains the different technologies available to acquire the images and their use for the non-destructive inspection of internal and external features of these fruits. Particular attention is paid to inspection for the early detection of some dangerous diseases like citrus canker, black spot, decay or citrus Huanglongbing.

Keywords: /Citrus / /Machine Vision/ /Postharvest/ /Quality/

GRAPES

Luo, Lufeng, et al. 2016. Vision-based extraction of spatial information in grape clusters for harvesting robots. Biosyst Eng. 151: 90-104.

Abstract

Grapes are likely to have collisions and be damaged by manipulations when harvesting grape clusters. To conduct an undamaged robotic harvesting, this paper focuses mainly on locating the spatial coordinates of the cutting points on a peduncle of grape clusters for the end-effector and determining the bounding volume of the grape clusters for the motion planner of the manipulator. A method for acquiring spatial information from grape clusters is presented based on binocular stereo vision. This method includes four steps: (1) calibrating the binocular cameras and rectifying the images, (2) detecting the cutting points on the peduncle and the centres of the grape berries, (3) extracting three-dimensional spatial coordinates of the points detected in step 2, and (4) calculating the bounding volume of the grape clusters. A total of 300 images were captured in the vineyard and were tested to validate the method for the cutting point detection, and the success rate was approximately 87%. The accuracy of the localisation of the cutting points was determined under outdoor conditions, and the accuracy in the Z and X directions was 12 mm and 9 mm, respectively. The acquired bounding volume of the grape cluster was compared with manual measurements, and errors in the height and maximum diameter were less than 17 mm and 19 mm, respectively. The elapsed time of the whole algorithm was less than 0.7 s. The demonstrated performance of this developed method indicated that it could be used on harvesting robots.

Keywords: /Grape/ /Harvesting/

LONGAN

Lin, Yifen, et al. 2017. Inhibitory effects of propyl gallate on membrane lipids metabolism and its relation to increasing storability of harvested longan fruit. Food Chem. 217: 133 - 138.

Abstract

Effects of propyl gallate on membrane lipids metabolism and its relation to storability of harvested longan fruits were studied. The results showed that the propyl gallate-treated longans maintained lower activities of pericarp phospholipase D (PLD), lipase and lipoxygenase (LOX) than those in control fruits. Such treatments could maintain higher levels of pericarp unsaturated fatty acids (USFAs), higher pericarp indices of unsaturated fatty acids (IUFA), and higher pericarp ratio of unsaturated fatty acids to saturated fatty acids (U/S) than those in control fruits. Furthermore, propyl gallate also delayed color changes of pericarp in the harvested longans. Therefore, the postharvest treatments of longan fruits with propyl gallate for increasing storability of longan fruits might be explained by a decrease in activities of PLD, lipase and LOX, and an the increased unsaturation of fatty acids, which could delay membrane lipids metabolism and maintain cell membrane characteristics.

Keywords: /Longan/ /Storage/

MANGO

Elsayed, Salah, et al. 2016. Passive reflectance sensing and digital image analysis for assessing quality parameters of mango fruits. Scientia Hort. 212: 136 - 147.

Abstract

Actual methods for assessing mango fruit quality are generally based on biochemical analysis, which leads to the destruction of fruits and is time consuming. Similarly, for valuating large quantities of mango fruits for export, numerous observations are required to characterize them; such methods cannot easily account for rapid changes in these parameters. The aims of this study to test the performance of hyperspectral passive reflectance sensing and digital image analysis was tested at various ripening degrees of mango fruits to assess their relationship to biochemical parameters (chlorophyll meter readings, chlorophyll a, chlorophyll b, total chlorophyll t, carotenoids, soluble solids content and titratable acidity) via simple linear regression and partial least square regression (PLSR) analysis. Models of PLSR included (i) spectral reflectance information from 500 to 900 nm, (ii) selected spectral indices, (iii) selected RGB indices from digital image analysis, and (iv) the combination of spectral reflectance indices and RGB indices information. The results showed that the newly developed index $(NDVI-VARI)/(NDVI-VARI)$ showed close and highly significant associations with chlorophyll meter readings, chlorophyll a and chlorophyll t, with $R^2= 0.78, 0.71,$ and $0.71,$ respectively, while the normalized difference vegetation index $(Red - Blue)/(Red + Blue)$ was highly significantly related to chlorophyll b, carotenoids, soluble solids content and titratable acidity, with R^2 values of $0.57, 0.53, 0.57,$ and $0.59,$ respectively. Calibration and validation models of the PLSR analysis based on the combination of data from six spectral reflectance indices and six RGB indices from digital image analysis further improved the relationships to chlorophyll meter readings ($R^2= 0.91$ and 0.88), chlorophyll a ($R^2= 0.80$ and 0.75), chlorophyll b ($R^2= 0.66$ and 0.57) and chlorophyll t ($R^2= 0.81$ and 0.80), while calibration and validation models of PLSR based on the data from the spectral reflectance range from 500 to 900 nm were most closely related to soluble solids content ($R^2= 0.72$ and 0.48) and titratable acidity ($R^2= 0.64$

and 0.49). In conclusion, the assessment of biochemical parameters in mango fruits was improved and more robust when using the multivariate analysis of PLSR models than with previously assayed normalized difference spectral indices and RGB indices from digital image analysis.

Keywords: /Mango/

Prasad, K., R. R. Sharma and Manish Srivastav. 2016. Postharvest treatment of antioxidant reduces lenticel browning and improves cosmetic appeal of mango (*Mangifera indica* L.) fruits without impairing quality. *J Food Sci. Technol.* 53(7): 2995 - 3001.

Abstract

The present study reports the usefulness of ascorbic acid for reducing lenticel browning (LB) in mango, which impairs the cosmetic appeal and thereby the export. Postharvest dip treatment of ascorbic acid at different concentrations (100, 150 and 200 ppm) was given to four varieties of mango (Indian— 'Dashehari', 'Langra'; Exotic— 'Sensation', 'Eldon'). After treatment, fruits were stored at ambient conditions (35 ± 4 °C and 65 ± 5 % RH) for 10 days. At the end of storage period, observations were recorded on several parameters. Our results revealed that fruits of 'Langra' mango exhibited 100 % LB, followed by 'Dashehari' (52.8 %), 'Sensation' (42.9 %) and 'Eldon' (38.3 %). All concentrations of ascorbic acid reduced the LB to greater extent and improved the cosmetic appeal of fruits of all the varieties significantly over untreated fruits but the best results were obtained with 200 ppm concentration for LB (4.8, 1.6, 3.7, 3.2 %, respectively) and other attributes, non-significantly followed by 150 ppm concentration. All concentrations of ascorbic acid also reduced the activities of polyphenol oxidase, peroxidase and lipoxigenase enzymes, and also reduced respiration rate and ethylene evolution rate but without impairing eating quality attributes (soluble solids concentration and total carotenoids). It can be concluded that postharvest dip application of ascorbic acid at 150 ppm reduced LB and improved face value without impairing fruit quality.

Keywords: /Mango/ /Fruit Quality/

Zhang, Zhengke, et al. 2017. Low-temperature conditioning induces chilling tolerance in stored mango fruit. *Food Chem.* 219: 76 - 84.

Abstract

In this study, mango fruit were pre-treated with low-temperature conditioning (LTC) at 12 °C for 24 h, followed by refrigeration at 5 °C for 25 days before removal to ambient temperature (25 °C) to investigate the effects and possible mechanisms of LTC on chilling injury (CI). The results showed that LTC effectively suppressed the development of CI in mango fruit, accelerated softening, and increased the soluble solids and proline content. Furthermore, LTC reduced electrolyte leakage, and levels of malondialdehyde, O_2 and H_2O_2 , maintaining membrane integrity. To reveal the molecular regulation of LTC on chilling tolerance in mango fruit, a C-repeat/dehydration-responsive element binding factor (CBF) gene, *MiCBF1*, was identified and its expression in response to LTC was examined using RT qPCR. LTC resulted in a higher *MiCBF1* expression. These findings suggest that LTC enhances chilling tolerance in mango fruit by inducing a series of physiological and molecular responses.

Keywords: /Mango/ /Chilling Injury/

MULBERRY

Espada-Bellido, Estrella, et al. 2017. Optimization of the ultrasound-assisted extraction of anthocyanins and total phenolic compounds in **mulberry** (*Morusnigra*) pulp. Food Chem. 219: 23 -32.

Abstract

New ultrasound-assisted extraction methods for the determination of anthocyanins and total phenolic compounds present in mulberries have been developed. Several extraction variables, including methanol composition (50–100%), temperature (10–70 °C), ultrasound amplitude (30–70%), cycle (0.2–0.7 s), solvent pH (3–7) and solvent-solid ratio (10:1.5–20:1.5) were optimized. A Box–Behnken design in conjunction with a response surface methodology was employed to optimize the conditions for the maximum response based on 54 different experiments. Two response variables were considered: total anthocyanins and total phenolic compounds. Extraction temperature and solvent composition were found to be the most influential parameters for anthocyanins (48 °C and 76%) and phenolic compounds (64 °C and 61%). The developed methods showed high reproducibility and repeatability (RSD < 5%). Finally, the new methods were successfully applied to real samples in order to investigate the presence of anthocyanins and total phenolic compounds in several mulberry jams.

Keywords: /Mulberry/ /Anthocyanins/

PINEAPPLE

Liu, Jiazhu, et al. 2017. The crown plays an important role in maintaining quality of harvested **pineapple**. Postharvest Biol. & Technol. 124: 18 - 24.

Abstract

Pineapple is a unique fruit partly because it has a beautiful crown and consumers around the world regard the crown as an integral part of pineapple fruit. However, farmers in some countries detach the crown at harvest and use it for propagation. It is not clear whether the detachment of crown affects quality of harvested pineapple. This study shows that decrowning aggravated internal browning by 55.2% and reduced SSC/TA ratio by 2.2, following 9-d storage, suggesting that decrowning deteriorated quality of the flesh and shortened shelf-life of fruit. Furthermore, decrowning increased reactive oxygen species (ROS), malondialdehyde (MDA), and phenolics levels, and upregulated polyphenol oxidase (PPO) and phenylalanine ammonia lyase (PAL) gene expression and activity, suggesting keeping crown intact prevented ROS generation and lipid peroxidation, and inhibiting phenolics biosynthesis and oxidation. Moreover, decrowning increased endogenous GAs (GA₁ and GA₄) and decreased endogenous ABA in pineapple tissues, suggesting crown is important for keeping balance between GAs and ABA. Exogenous application of ABA inhibited IB in pineapple with intact crown more effectively than in decrowned one, ABA application to crown only controlled IB as effectively as to both crown and fruit, and decrowning following ABA application to crown significantly compromised the efficacy. These suggest that the crown is the main source of endogenous ABA and that IB control depends on continuous supply of ABA from the crown. This study provides possibility for effectively controlling IB.

Keywords: /Pineapple/ /Internal Browning/ /Quality/

PITAYA FRUIT

Li, Xiaolan, et al. 2017. Effect of cutting styles on quality and antioxidant activity in fresh-cut **pitaya fruit**. *Postharvest Biol & Technol.* 124: 1 - 7.

Abstract

The effect of different cutting styles on the quality and antioxidant activity of pitaya fruit during 4 d of storage at 15 °C was investigated. Pitaya fruit was cut into slice, half-slice and quarter-slice, all in 1 cm of thickness, with corresponding wounding intensity (A/W) of 2.0, 2.9 and 3.7 cm² g⁻¹, respectively. Results: showed that cutting styles had little influence on fruit quality parameters such as vitamin C, soluble solids, titratable acidity and flesh color. While total phenolic content, antioxidant activity, and phenylalanine ammonia-lyase activity increased significantly with cutting wounding intensity at the first 2 d of storage. In addition, fresh-cut processing induced the reactive oxygen species (ROS) generation and enhanced the activity of antioxidant enzymes including catalase, superoxide dismutase and glutathione reductase at the initial storage time. These results demonstrated that cutting styles didn't have much adverse effect on the organoleptic quality, but significantly induced the biosynthesis of phenolics and improved the antioxidant activity of fresh-cut pitaya fruit. Moreover, ROS may act as signaling molecules in the accumulation of phenolics in fresh-cut pitaya fruit.

Keywords: /Pitaya fruit/ /Quality/

SWEET CHERRY

Param, Natalia and Juan Pablo Zoffoli. 2016. Genotypic differences in **sweet cherries** are associated with the susceptibility to mechanical damage. *Scientia Hort.* 211: 410 - 419.

Abstract

The rheological properties and structure of the flesh tissue at harvest-ripe fruit of the sweet cherry *Prunus avium* L. cultivars Bing, Lapins, Regina, Santana, Sweetheart and Van were measured using textural analyzer equipment and described by light microscopy, respectively. The rheological measurements inflicted reproducible levels of mechanical damage (pitting). The structural and rheological properties of the mesocarp and epidermis correlate with their susceptibility to mechanical damage. Epidermal cell width and area of external mesocarp cells were negatively associated with susceptibility to mechanical damage while cell number, quantified in 1 mm² of external mesocarp, was positively associated. Fruit of Bing and Regina are the least susceptible to mechanical damage among the cultivars under study. The least sensitivity of Regina fruit was associated with its wide epidermal cells and high value of modulus of elasticity, while in Bing with its low number of cells as well as high values of stress and strain at bioyield point. The high susceptibility to mechanical damage of Sweetheart and Lapins fruit was associated with their large number of cells in the external mesocarp tissue and with the lowest values of strain at bioyield point, therefore with the lowest deformation capacity of the tissue.

Keywords: /Sweet Cherry/ /Quality/ /Postharvest

Turturică, Mihaela, et al. 2016. Investigations on **Sweet Cherry** Phenolic Degradation During Thermal Treatment Based on Fluorescence Spectroscopy and Inactivation Kinetics. Food Bioprocess Technol. 9: 1706 - 1715.

Abstract

Five anthocyanins were detected in the sweet cherry extract as follows: cyanidin 3-rutinoside, cyaniding 3-glucoside, peonidin 3-rutinoside, peonidin 3-glucoside, and pelargonidin 3-rutinoside, whereas the cyanidin 3- rutinoside was found to be in the highest amount. The effect of thermal treatment on the degradation of the polyphenolic compounds in sweet cherry extract was investigated in the range of 70–120 °C by means of fluorescence spectroscopy and spectrophotometric techniques. The fluorescence spectra were dominated by emission bands with maximum ranging from 356 nm at 25 °C to 350 nm at 110 °C. The heating of sweet cherry extract resulted in structural changes that led to a significant decrease in fluorescence intensity when increasing temperature. Degradation rate constants were estimated using a fractional conversion kinetic model. The activation energy values revealed a higher-temperature dependence of antioxidant activity, followed by anthocyanins, total polyphenols, and total flavonoids.

Keywords: /Sweet Cherries/ /Anthocyanins/ /Thermal Treatment/

VEGETABLES

BROCCOLI

Lv, Jiayu, et al. 2017. Effect of Se treatment on the volatile compounds in **broccoli**. Food Chem. 216: 225-233.

Abstract

Broccoli contains high levels of bioactive compounds but deteriorates and senesces easily. In the present study, freshly harvested broccoli was treated with selenite and stored at two different temperatures. The effect of selenite treatment on sensory quality and postharvest physiology were analyzed. Volatile components were assessed by HS-SPME combined with GC–MS and EN. The metabolism of Se and S was also examined. Results indicated that Se treatment had a significant effect on maintaining the sensory quality, suppressing the respiration intensity and ethylene production, as well as increasing the content of Se and decreasing the content of S. In particular, significant differences in the composition of volatile compounds were present between control and Se-treated. The differences were mainly due to differences in alcohols and sulfide compounds. These results demonstrate that Se treatment can have a positive effect on maintaining quality and enhancing its sensory quality through the release of volatile compounds.

Keywords: /Broccoli/

MUSHROOM

Lin, Qiong, et al. 2017. Effects of high CO₂ in-package treatment on flavor, quality and antioxidant activity of button **mushroom** (*Agaricus bisporus*) during postharvest storage. *Postharvest Biol. & Technol.* 123: 112 - 118.

Abstract

Button mushroom (*Agaricus bisporus*) is marketed for its good flavor and health benefits. However, the shelf life of fresh button mushroom is limited and quality is lost rapidly during storage. In this study, button mushrooms were treated with high CO₂ (95%–100%) at the time of sealing of the packages and the packages were ventilated after 0, 12, 24 and 48 h by puncturing the film at four corners. Results showed that 12 h high CO₂ treatment had a significant effect in reducing browning index (BI) and maintaining flavor of button mushroom during storage. In addition, the malonaldehyde (MDA) content was significantly inhibited while catalase (CAT) and peroxidase (POD) activities were significantly promoted by high CO₂ treatment. High CO₂ treatment increased antioxidant ability of button mushroom, which in turn maintained the flavor, quality and consumer acceptance of button mushroom during postharvest storage.

Keywords: /Mushroom/ /Packaging/ /Browning/ /Postharvest/ /Storage/

ONION

Han, Cong, et al. 2016. Influence of wounding intensity and storage temperature on quality and antioxidant activity of fresh-cut Welsh **onions**. *Scientia Hort.* 212: 203 -209.

Abstract

Welsh onion (*Allium fistulosum* L.) is a very popular, medicinal and functional vegetable in East Asian countries. Welsh onion can be processed into different cuts and widely used as flavoring agent in food processing. In this study, the effects of wounding intensity (slices, pieces, and shreds) and storage temperature (4 and 20°C) on postharvest quality and antioxidant activity of fresh-cut Welsh onions were studied. Our results showed that increased wounding intensity and higher storage temperature both led to the sharp rise of respiration rate, and the increasing loss of pungency, soluble solids content and ascorbic acid. On the other hand, the increase of phenylalanine ammonia-lyase activity, the accumulation of phenolic compounds and the enhancement of antioxidant capacity were intensified with increased wounding intensity and higher storage temperature. The shelf life of 4°C stored slices, pieces and shreds was determined to 5 d, while for 20°C stored samples, this threshold was shortened to 1.5, 1.5 and 1d, respectively. Thus, our results suggested that increased wounding intensity and higher storage temperature reduce postharvest quality and shorten shelf-life, but increase antioxidant activity of fresh-cut Welsh onions.

Keywords: /Onion/ /Fresh-Cut/ /Shelf-Life/

TOMATO

Tadesse, TigistNardos and WoseneGebreselassieAbteu. 2016. Effect of hot water treatment on reduction of chilling injury and keeping quality in **tomato** (*Solanum lycopersicum*L.) fruits. J Stored Prod Res. 7(7): 61 - 68.

Abstract

Chilling injury is a physiological disorder caused by the exposure of fruits and vegetables to low temperature above the freezing point. Chilling can delay fruit ripening in tomato fruits. The objective of this study was to determine the effect of hot water treatment on reduction of chilling injury and keeping quality of tomato fruits. The experiment was done in post-harvest physiology laboratory of Jimma University using Complete Randomised Design (CRD) arrangement of treatments replicated three times. The experiment had three treatments: green mature tomato treated in water at 40°C and 50°C both for 20 min and control (non-treated) fruits. Results have indicated that 40°C treatment for 20 min resulted in reduced weight loss and chilling injury index but increased fruit firmness during storage. Moreover, shelf life was better than control by three and half days when fruits were treated by hot water at 40°C for 20 min. With regard to chemical quality attributes, 50°C treatment for 20 min was better for higher lycopene content compared to other treatments. Significant differences were not detected among the treatments for total soluble solids, pH and β -carotene. Hence, hot water treatment before storage can alleviate chilling injury and improving some quality characteristics of tomato fruits.

Keywords: /Tomato/ /Chilling injury/ /Hot Water Treatment/ /Quality/

Xie, Fang, et al. 2017. Effect of yeast mannan treatments on ripening progress and modification of cell wall polysaccharides in **tomato** fruit. Food Chem. 218: 509 - 517.

Abstract

Yeast mannan treatments effectively delayed colour change and firmness decline and inhibited ethylene production in two cultivars of tomato fruit during storage. The yeast mannan treatment maintained the integrity of tomato pericarp cell wall architecture and suppressed the modification of water-soluble and insoluble pectic polysaccharides in the cell wall. A decrease in the neutral sugars, including D-galactose, L-arabinose and L-rhamnose, in water-insoluble pectin and an increase in these sugars in water-soluble pectin were inhibited by yeast mannan. The contents of D-xylose and D-mannose in the hemicellulose fraction were significantly higher in the yeast mannan-treated fruit after storage. The activities of several cell wall-modifying enzymes, including pectinmethylesterase, polygalacturonase and β -galactosidase, were suppressed in fruit treated with yeast mannan during storage. Overall, the yeast mannan-induced delay in the ripening progress of tomato fruit might occur via the strong suppression of ethylene synthesis, causing inhibition of solubilization and depolymerization of cell wall polysaccharides.

Keywords: /Tomato/ /Ethylene/

Zhu, Zhu, et al. 2017. Selenium delays **tomato** fruit ripening by inhibiting ethylene biosynthesis and enhancing the antioxidant defense system. Food Chem. 219: 179 - 184.

Abstract

The antioxidant activity of selenium (Se) detoxifies reactive oxygen species (ROS) in plants and animals. In the present study, we elucidated the mechanism underlying Se induced fruit development and ripening. Our study showed that foliar pretreatment with 1 mg L⁻¹ sodium selenate effectively delayed fruit ripening and maintained fruit quality. Gene expression studies revealed that the repression of ethylene biosynthetic genes 1-aminocyclopropane-1-carboxylic acid (ACC) synthase and ACC oxidase decreased ethylene production and respiration rate. Moreover, Se treatment probably boosted the antioxidant defense system to reduce ROS generation and membrane damage. The enhanced antioxidative effect was attributed to higher glutathione content and increased activity of enzymes such as glutathione peroxidase and glutathione reductase. The upregulation of respiratory burst oxidase homologue genes in tomato fruit may also contribute to the enhanced antioxidative effect. Selenium treatment represents a promising strategy for delaying ripening and extending the shelf life of tomato fruit.

Keywords: /Tomato/ /Antioxidant/ /Postharvest/ /Ripening/

Zoellner, Claire, et al. 2016. Microbial dynamics of indicator microorganisms on fresh **tomatoes** in the supply chain from Mexico to the USA. *Int'l. J. Food Microbiol.* . 238: 202 - 207.

Abstract

Quality and safety of fresh produce are important to public health and maintaining commerce between Mexico and USA. While preventive practices can reduce risks of contamination and are generally successful, the variable environment of the supply chain of fresh produce can be suitable for introduction or proliferation of pathogenic microorganisms. As routine surveillance of these pathogens is not practical, indicator microorganisms are used to assess the sanitary conditions of production and handling environments. An opportunity exists to use indicators on fresh produce to measure how handling and transport from field to market may affect microbial populations that contribute to their quality or safety. The objective was to quantify indicator microorganisms on tomatoes sampled along the supply chain during the harvest year, in order to observe the levels and changes of populations at different locations. Roma tomatoes (n = 475) were taken from the same lots (n = 28) at four locations of the postharvest supply chain over five months: at arrival to and departure from the packinghouse in México, at the distribution center in Texas, and at retail in USA. Samples were analyzed individually for four microbial populations: aerobic plate count (APC), total coliforms (TC), generic *Escherichia coli*, and yeasts and molds (YM). APC population differed (p < 0.05) from 1.9 ± 1.1, 1.7 ± 1.1, 2.3 ± 1.1 and 3.5 ± 1.4 log CFU/g at postharvest, packing, distribution center and supermarket, respectively. TC populations were < 1 log CFU/g at postharvest, increased at packing (0.7 ± 1.0 log CFU/g), decreased in distribution (0.4 ± 0.8 log CFU/g) and increased in supermarkets (1.4 ± 1.5 log CFU/g). Generic *E. coli* was not identified from coliform populations in this supply chain. YM populations remained < 1 log CFU/g, with the exception of 1.1 ± 1.3 log CFU/g at supermarkets and tomatoes were not visibly spoiled. The levels reported from this pilot study demonstrated the dynamics within populations as influenced by time and conditions in one supply chain during a harvest year, while the large variances in some locations indicate opportunities for improvement. Overall, packinghouse and supermarket locations were identified as crucial points to control microbial safety risks.

Keywords: /Tomatoes/ /Postharvest/ /Supply Chain/

HERBS AND SPICES

GREEN CHILLIES

Chitravathi, K., O. P. Chauhan and P. S. Raju. 2016. Shelf life extension of **green chillies** (*Capsicum annuum*L.) using shellac-based surface coating in combination with modified atmosphere packaging. J Food Sci Technol. 53(8): 3320 - 3328.

Abstract

Shellac-based surface coating was used in combination with passive modified atmosphere (MA) packaging for shelf life extension of fresh green chillies. The green chillies were coated with shellac coating, packed in anti-fog film and kept at 8 ± 1 °C for storage along with uncoated control. The coated and MA packed chillies showed significantly lower respiration rates as compared to control. The physico-chemical characteristics showed significantly lesser variations in terms of physiological loss in weight, firmness, colour, pigments, ascorbic acid and antioxidant activity during storage. A shelf life extension of 48 days was observed for coated and MA packed chillies against uncoated and MA packed (28 days) and control (15 days) ones. Shellac coated chillies showed a shelf life of 30 days at 8 ± 1 °C. Shellac coating along with the passive MA packaging resulted in restriction of metabolic activities(respiration) and delayed senescence and was found most effective in maintaining the postharvest quality of green chillies during low temperature storage.

Keywords: /Green Chillies/ /Modified Atmosphere Packaging/ /Postharvest/ /Quality/

TUBERS AND ROOT CROPS

CASSAVA

Pagno, Carlos Henrique, et al. 2016. Synthesis of biodegradable films with antioxidant properties based on **cassava** starch containing bixinanocapsules. J.Food Sci.Technol. 53(8): 3197 - 3205.

Abstract

Biodegradable and active packaging based on cassava starch incorporated bixinanocapsules with different concentrations were developed. The physical, mechanical, barrier properties and antioxidant activity of the active packaging were studied. The films incorporated with bixinanocapsules were found to be homogeneous and thermally stable. Films with higher concentrations of bixinanocapsules exhibited a significant decrease in tensile strength, water solubility and increase in elongation at break and water vapour permeability, well as, significant improvement in protection against UV and visible light. The films were used to pack sunflower oil under accelerated oxidation conditions (65 % RH/35 °C). Sunflower oil packaged in films with bixin exhibited lower oxidation rates, thus maintaining its freshness according to *Codex Alimentarius* guidelines (≤ 10 mEq kg⁻¹). Films containing bixinanocapsules are very promising materials for use as packaging with antioxidant properties for maintaining foodsafety and extending the shelf life.

Keywords: /Cassava/ /Biodegradable Films/ /Active Packaging/

LOTUS ROOT

Gao, Hui, et al. 2017. Effects of 24-epibrassinolide on enzymatic browning and antioxidant activity of fresh-cut **lotus root** slices. Food Chem. 217: 45 - 51.

Abstract

Fresh-cut lotus root slices were treated with 80 nM 24-epibrassinolide (EBR) and then stored at 4 °C for 8 days to investigate the effects on cut surface browning. The results showed that EBR treatment reduced cut surface browning in lotus root slices and alleviated membrane lipid peroxidation as reflected by low malondialdehyde content and lipoxygenase activity. EBR treatment inhibited the activity of phenylalanine ammonia lyase and polyphenol oxidase, and subsequently decreased phenolics accumulation and soluble quinones formation. The treatment also stimulated the activity of peroxidase, catalase and ascorbate peroxidase and delayed the loss of ascorbic acid, which would help prevent membrane lipid peroxidation, as a consequence, reducing decompartmentation of enzymes and substrates causing enzymatic browning. These results indicate that EBR treatment is a promising attempt to control browning at cut surface of fresh-cut lotus root slices.

Keywords: /Lotus Root/ /Browning/

POTATO

Dai,Hongfei, et al. 2016. Ethylene inhibited sprouting of **potato** tubers by influencing the carbohydrate metabolism pathway. J. Food Sci.Technol. 53(8): 3166 - 3174.

Abstract

The aim of this study was to investigate the role of ethylene to control sprouting of potatoes by observing the effect of exogenous ethylene on carbohydrate metabolism and key enzymes. The initial time of potato tuber sprouting and sprouting index were recorded, and rate of respiration, total sugar, total reducing sugar, starch, fructose, glucose, sucrose and the activities of acid invertase(AI), neutral invertase (NI), sucrose synthase (SS), sucrose phosphate synthase (SPS), starch phosphorylase and amylase during sprouting were measured. Exogenous ethylene inhibited sprouting of potato tubers. Moreover, exogenous ethylene increased respiration total sugar, AI activity, SPS activity, SS activity, and reduced sugar and assay activity. Nevertheless, starch, glucose, fructose, NI activity and starch phosphorylase activity showed lower variation. Lower sprouting resulted into potatoes with higher levels of total sugar, total reducing sugar and glucose, and lower level of fructose and sucrose. And sprouting could be inhibited by increasing the activities of SS, SPS and AI by treatment with 199.3 μL^{-1} exogenous ethylene. Overall, exogenous ethylene inhibited sprouting of potato tubers by influencing its carbohydrate metabolism.

Keywords: /Potato/ /Sprouting/

Teoh, Li Shing, et al. 2016. The effect of ultraviolet treatment on enzymatic activity and total phenolic content of minimally processed **potato** slices. J.Food Sci.Technol. 53(7): 3035 - 3042.

Abstract

In this work, potato slices were exposed to different doses of UV-C irradiation (i.e. 2.28, 6.84, 11.41, and 13.68 kJ m⁻²) with or without pretreatment [i.e. ascorbic acid and calcium chloride (AACCI) dip] and stored at 4 ± 1 °C. Changes in enzymatic activities of polyphenol oxidase (PPO), peroxidase (POD) and phenylalanine ammonia lyase (PAL), as well as total phenolic content (TPC) were investigated after 0, 3, 7 and 10 days of storage. Results showed that untreated and UV-C treated potato slices at 13.68 kJ m⁻² dosage level showed significantly higher PPO, POD and PAL activities. Conversely, untreated potato slices showed the lowest TPC during storage period. Potato slices subjected to AACCI dip plus UV-C at 6.84 kJ m⁻² produced lower PPO, POD and PAL activities, as well as maintained a high TPC during storage.

Keywords: /Potato/ /Enzymatic Browning//UV-C treatment/

ORNAMENTALS

GLADIOLUS

Li, Hongbo, et al. 2017. Nano-silver treatments reduced bacterial colonization and biofilm formation at the stem-ends of cut gladiolus 'Eerde' spikes. *Postharvest Biol. & Technol.* 123: 102 - 111.

Abstract

Postharvest treatments with nano-silver (NS) alleviate bacteria-related stem blockage of some cut flowers to extend their longevity. *Gladiolus* (*Gladiolus hybridus*) is a commercially important cut flower species. For the first time, the effects of NS pulses on cut *gladiolus* 'Eerde' spikes were investigated towards reducing bacterial colonization and biofilm formation on their stems. As compared with a deionized water (DIW) control, pulse treatments with NS at 10, 25 and 50 mg L⁻¹ for 24 h significantly ($P \leq 0.05$) prolonged the vase life of cut *gladiolus* spikes moved into vases containing DIW. The NS treatments enhanced floret 'opening rate' and 'daily ornamental value'. Although there were no significant differences among NS treatments, a 25 mg L⁻¹ NS pulse treatment tended to give the longest vase life and the best 'display quality'. All NS pulse treatments significantly improved water uptake by and reduced water loss from flowering spikes, thereby delaying the loss of water balance and maintaining relative fresh weight. Fifty (50) mg L⁻¹ NS pulse-treated cut *gladiolus* spikes tended to exhibit the most water uptake and highest water balance over the vase period. However, there was no significant difference between 25 and 50 mg L⁻¹ NS pulse treatments. Observations of stem-end bacterial proliferation during the vase period on cut *gladiolus* spikes either with or without NS pulse treatments were performed by confocal laser scanning microscopy (CLSM) and scanning electron microscopy (SEM). As compared to the control treatment, they revealed that the 25 mg L⁻¹ NS pulse treatment effectively inhibited bacterial colonization and biofilm formation on the stem-end cut surface and in the xylem vessels, respectively. In vitro culture of the bacterial microflora and analysis of biofilm architecture using CLSM revealed that NS treatment restricted bacterial biofilm formation. After static culture for 24 h at 35 °C with 25 mg L⁻¹ NS in the medium, no biofilm form or structure was evident. Rather, only limited bacterial cell number and scanty extracellular polysaccharide (EPS) material were observed. In contrast, mature bacterial biofilm architecture comprised of abundant bacteria interwoven with EPS formed in the absence of NS.

Keywords: /Gladiolus/ /Bacterial Biofilm//Cut flower/

MARIGOLD

Pal, Sayani and Paramita Bhattacharjee. 2016. Effect of gamma-irradiation on **Marigold** (*Tagetes erecta* L.) cut flowers: changes in sensory and physicochemical properties and lutein content. 04(03): 037-049.

Abstract

Marigold flowers packaged in low density polyethylene (LDPE) were subjected to gamma irradiation in the dose range of 0.02-2.5 kGy and stored in an environmental chamber (23±2°C, 80% R.H.) along with positive (nonirradiated LDPE packaged flowers) and negative control (non-packaged, nonirradiated flowers) sets for evaluation of their shelf-lives. Assays of sensory and physicochemical parameters of senescence revealed that flowers irradiated at 2.3 kGy had the highest shelf-life of 11 days, with a lead of 5 and 7 days vis-à-vis positive and negative controls, respectively. This study established for the first time the phenomenon of carotenogenesis (synthesis of 'lutein') in both irradiated and non-irradiated marigold flowers, with highest production and preservation of lutein in 2.3 kGy irradiated flowers. Thus gamma irradiation can boost the export potential of this flower, both for its ornamental and therapeutic value.

Keywords: /Marigold/ /Gamma-irradiation/ /Shelf-life/

POTTED PLANTS

Tromp, Seth-Oscar, et al. 2017. On the validation of improved quality-decay models of **potted plants**. Postharvest Biol. & Technol. 123: 119 - 127.

Abstract

Storage experiments were carried out with potted plants: two *Phalaenopsis* cultivars and one *Anthurium* cultivar. The plants were stored in the dark for different storage times at different temperatures, to mimic a transport phase. Different quality aspects were scored immediately after the transport phase and after a subsequent display phase of 7 and 14 days at in-store conditions. Improved quality decay models compared to previous work were designed to quantify the effect of transport on the shelf life of potted plants. Of each cultivar, plants were obtained from two commercial growers in the Netherlands. Only the data from the first grower were used for improving the quality-decay models. The models were subsequently validated using the data from the second grower, as well as data from the first grower from year 2013 instead of 2015. So validation took place both in origin (a different grower) and in time (a different year). The validation showed that the behaviour of *Anthurium* 'Arion' was well predicted by the previously designed quality-decay models. For *Phalaenopsis* the performance of the quality-decay models differed per storage temperature. It was concluded that a quality-decay model first needs to be validated before it can be applied to predict the quality decay of a different production batch.

Keywords: /Potted Plants/ /Quality/ /Storage/