References

CHAPTER VI

REFERENCE

[Anonymous]. 2018. Kerala govt declares jackfruit as official fruit. Hindustan Times. 21 March 2018.https://www.hindustantimes.com.

[Anonymous]. 2020. High pressure processing market report. Research and market. Available:https://www.researchandmarkets.com.

[Anonymous]. 2022. Kerala produces 28.6 crore jackfruits a year. Onmanorama.26 August 2016.https://www.onmanorama.com.

Aabya, K., Grimsboa, I.H., Hovdab, M.B. and Rodeb, T.M. 2018. Effect of high pressure and thermal processing on shelf life and quality of strawberry puree and juice. *Food Chem*. 260: 115-123.

Abdullah, N., Chin, N.L., Yusof, Y.A. and Talib, R.A. 2018. Modeling the rheological behavior of thermosonic extracted guava, pomelo, and soursop juice concentrates at different concentration and temperature using a new combination model. *J. Food Processing and Preservation*. 42(2): e13517.

Abera, G. 2019. Review on high-pressure processing of foods. *Cogent Food Agric.* 5(1): 1568725. https://doi.org/10.1080/23311932.2019.1568725.

Abid, M., Jabbar, S., Hu, B., Hashim, M. M., Wu, T., Wu, Z., Khan, M. A. and Zeng, X. 2014. Synergistic impact of sonication and high hydrostatic pressure on microbial and enzymatic inactivation of apple juice. *LWT - Food Sci. Technol.* 59(1):70–76.

Abida, J.R.B.M.F.A., Rayees, B. and Masoodi, F.A. 2014. Pulsed light technology: a novel method for food preservation. *Int. Food Res. J.* 21(3):39.

Abrol, G.S. and Joshi, V.K. 2011. Effect of different initial TSS level on physico-chemical and sensory quality of wild apricot mead. *Int. J. Food Ferm. Technol.* 1(2): 221-229.

Agcam, E., Akyıldız, A., Kamat, S. and Balasubramaniam, V.M. 2021. Bioactive compounds extraction from the black carrot pomace with assistance of high pressure processing: an optimization study. *Waste and Biomass Valorization* 12:1-19.

Aghajanzadeh, S. and Ziaiifar, A. M. 2018. A review of pectin methylesterase inactivation in citrus juice during pasteurization. *Trends in Food Sci. Technol.*71: 1-12.

Aguero, M.V., Jagus, R.J., Martin-Belloso, O. and Soliva-Fortuny, R. 2016. Surface decontamination of spinach by intense pulsed light treatments: Impact on quality attributes. *Postharvest Biol. Technol*. 121: 118-125.

Aguilo-Aguayo, I., Charles, F., Renard, C.M., Page, D. and Carlin, F. 2013. Pulsed light effects on surface decontamination, physical qualities and nutritional composition of tomato fruit. *Postharvest Biol Technol*. 86: 29–36.

Aguiló-Aguayo, I., Charles, F., Renard, C.M., Page, D. and Carlin, F. 2015. Pulsed light effects on surface decontamination, physical qualities and nutritional composition of tomato fruit. *Postharvest Biol. Technol.* 86: 29-36.

Ahmed, J., Ramaswamy, H. S. and Hiremath, N. 2005. The effect of high pressure treatment on rheological characteristics and colour of mango pulp. *Int. J. Food Sci. Technol.* 40(8): 885-895.

Al-Baali, A.A.G. and Farid, M.M. 2007. Sterilization of food in retort pouches. *Springer Sci. Business Media*. 10p.

Al-Ghamdi, S., Sonar, C.R., Patel, J., Albahr, Z. and Sablani, S.S. 2020. High pressure-assisted thermal sterilization of low-acid fruit and vegetable purees: Microbial safety, nutrient, quality, and packaging evaluation. *Food Control*. *114*:107233.

Ali, S. and Smith, J. 2022. Nutritional impact of pulsed light on orange pulp. *J. Food Sci. Technol.* 59(4): 1234-1240. https://doi.org/10.1007/s11483-021-02134-5.

Allai, F.M., Z.R. Azad, A.A., Mir, N.A. and Gul, K. 2023. Recent advances in non-thermal processing technologies for enhancing shelf life and improving food safety. *Appl. Food Res*. 3:100258.

Amadi, J.A.C., Ihemeje, A and Afam-Anene, O.C. 2018. Nutrient and Phytochemical Composition of Jackfruit (*Artocarpus heterophyllus*) Pulp, Seeds and Leaves. *Int. J. Innovative Food, Nut. Sust. Agric*. 6(3):27-32.

An, K.A.K., Liu, H.C.L.H., ManQin, F.M., Qian, M.C., Yu YuanShan, Y.Y., Wu JiJun, W.J., GengSheng, X.G. and YuJuan, X.Y., 2019. Identification of the cooked off-flavor in heat-sterilized lychee (*Litchi chinensis Sonn.)* juice by means of molecular sensory science. *Food Chem.*1301:25282.

Anaya-Esparza, L.M., Ramos-Aguirre, D., Zamora-Gasga, V.M., Yahia, E.M. and Montalvo-González, E. 2018. Optimization of ultrasonic-assisted extraction of phenolic compounds from Justicia spicigera leaves. *Food Sci. Biotechnol*. 27:1093-1102.

Andrés, V., Villanueva, M. J. and Tenorio, M. D. 2016. The effect of high-pressure processing on colour, bioactive compounds, and antioxidant activity in smoothies during refrigerated storage. *Food chem*. 192:328-335.

AOAC. 1990. Official methods of analysis. Association of Official Analytical Chemists. 16th Edition. Washington D.C.

AOAC. 2000. Official Methods of Analysis. Association of Official Analytical Chemists. Washington.

Arampath, P.C. and Dekker, M. 2019. Bulk storage of mango (*Mangifera indica L*.) and pineapple (*Ananas comosus L*.) pulp: effect of pulping and storage temperature on phytochemicals and antioxidant activity. *J. Sci. Food Agric.* 99(11): 5157-5167.

Ashitha, G.N. and Prince, M.V. 2020. Development and evaluation of flow through ohmic heating assisted pulsed light treatment system for preservation of fruit juice (Doctoral dissertation, Department of Post Harvesting and Agricultural Engineering).

Astuti, D.S., Salengke, S., Laga, A., Mariyati-Bilangd, M., Mochtar, H. and Warisf, A. 2018. Characteristics of pH, total acid, total soluble solid on tomato juice by ohmic heating technology. *Int. J. Sci. Basic Appl. Res.* 39(2): 21-28.

Babu, P. S., and Sudheer, K. P. 2020. Quality evaluation of thermal processed tender jackfruit during storage. *J. Tropical Agric*. 58(1).

Badina, E.E., Rossia, Y.E., Montenegroa, M., Ibarzb, A., Ribottac, P.D. and Lespinard, A.R. 2020. Thermal processing of raspberry pulp: Effect on the colour and bioactive compounds. *Food and Bioproducts Processing*. 124: 469-477.

Bansal, V., Jabeen, K., Rao, P.S., Prasad, P. and Yadav, S.K. 2019. Effect of high pressure processing on microbial safety, physicochemical properties, and bioactive compounds of whey-based sweet lime (whey-lime) beverage. *J. Food Measurement and Characterization.* 13:454-465.

Bansal, V., Siddiqui, M.W. and Rahman, M.S. 2015. Minimally Processed Foods: Overview. In: Siddiqui, M., Rahman, M. (eds) Minimally Processed Foods. *Food Eng. Series.* https://doi.org/10.1007/978-3-319-10677-9_1.

Bao, S., Yin, D., Zhao, Q., Zhou, Y., Hu, Y., Sun, X., Liu, X. and Ma, T. 2023. Comprehensive evaluation of the effect of five sterilization methods on the quality of black carrot juice based on PCA, TOPSIS, and GRA models. *Food Chem.* 17:100604.

Barbhuiya, R., Islam, S., Singha, P. and Kumar, S. 2021. A comprehensive review on impact of non-thermal processing on the structural changes of food components. *Food Res. Int*. 140:10-123.

Barcelos, C.H.B., Bezerra Cavalcante, T.A.W., Wilhelms Gut, J.A.O. and Oliveira Silva, D.M. 2022. An experimental and numerical evaluation of continuous pasteurization of açai pulp with plate heat exchangers. *J. Food Eng.* 302:110560.

Baroni, M.V., Gastaminza, J., Podio, N.S., Lingua, M.S., Wunderlin, D.A., Rovasio, J.L., Dotti, R., Rosso, J.C., Ghione, S. and Ribotta, P.D. 2018. Changes in the antioxidant properties of quince fruit(*Cydonia oblonga Miller*) during jam production at industrial scale. *J. Food Quality*. http://dx.doi.org/10.1155/2018/1460758.

Barros-Castillo, J.C., Calderón-Santoyo, M., Cuevas-Glory, L.F., Calderón-Chiu, C. and Ragazzo-Sánchez, J.A. 2023. Contribution of glycosidically bound compounds to aroma potential of jackfruit (*Artocarpus heterophyllus lam*). *Flavour and Fragrance J*. 38(3): 193-203.

Basak, S., Mahale, S. and Chakraborty, S. 2022. Changes in quality attributes of pulsed light and thermally treated mixed fruit beverages during refrigerated storage (4°C) condition. *Innovative Food Sci. Emerging Technol*. 78:103025.

Bevilacqua, A., Petruzzi, L., Perricone, M., Speranza, B., Campaniello, D., Sinigaglia, M. and Corbo, M. R. 2018. Nonthermal technologies for fruit and vegetable juices and beverages: Overview and advances. *Comprehensive Rev. Food Sci. Food Safety*. 17(1): 2-62.

Bhagat, B. and Chakraborty, S. 2022. Potential of pulsed light treatment to pasteurize pomegranate juice: Microbial safety, enzyme inactivation, and phytochemical retention. *LWT-Food Sci. Technol.* 159: 113215.

Bhat, S., Singh., Saini, C., Kumar, M. and Sharma, H.K. 2016. Effect of thermal andalternate thermal processing on bottle gourd (*Lagenaria siceraria*) juice. *J. Food Processing and Preservation.* Pres. https://doi.org/10.1111/jfpp.12911.

Bhavya, M. L. and Hebbar, U.H. 2017. Pulsed light processing of foods for microbial safety. *Food Quality and Safety*. 1(3): 187-202. https://doi.org/10.1093/fqsafe/fyx017.

Bi, X., Zhou, Z., Qin, T., Wang, X., Ma, Y., Xing, Y. and Che, Z. 2020. Effects of high pressure processing on microorganisms and the quality of mango smoothies during storage. *RSC advances.*10(52):31333-31341.

Bialkowski, C. and Kaczmarek, K. 2019. Impact of high pressure processing on the quality of cloudy apple juice. *J. Food Eng.* 245:1-7. https://doi.org/10.1016/j.jfoodeng.2018.11.024.

Bobbio, F.O., El-Dash, A.A., Bobbio, P.A. and Rodrigues, L. R. 1978. Isolation and characterization of the physicochemical properties of the starch of jackfruit seeds (*Artocarpus heterophyllus*). *Cereal Chem*. 55(4):505–511.

Brahma, R. and Ray, S. 2023. Finding out various potentials and possibilities of jackfruit seed and its usage in the industry: A review. *Food Prod. Processing and Nutr.* 5: 55. https://doi.org/10.1186/s43014-023-00170-z.

Briones-Labarca, V., Giovagnoli-Vicuña, C., Figueroa-Alvarez, P., Quispe-Fuentes, I. and Pérez-Won, M. 2013. Extraction of β-carotene, vitamin C and antioxidant compounds from Physalis peruviana (Cape Gooseberry) assisted by high hydrostatic pressure. *Food Nutr. Sci*. 4(8):109-118.

Butz, P., Edenharder, R., García, A. F., Fister, H., Merkel, C. and Tauscher, B. 2002. Changes in functional properties of vegetables induced by high pressure treatment. *Food Res. Int.* 35(2-3): 295-300.

Cao, Y., Wang, G., Huang, Y., Zhu, R., Wang, Q., Wei, S. and Yao, X. 2018. Colour Change and Kinetics of Winter Jujube Slices during Pulsed Air-Jet Impingement Drying. *Czech J. Food Sci*. 36(4).

Caufield, H. 2014. Development of continuous processing method for pouches in rotary retorts (Doctoral dissertation, University of Illinois at Urbana-Champaign).

Chaikham, P. and Prangthip, P. 2015. Physical and biochemical properties of Yanang juice mixed with longan flower-honey following high pressure processing. *Int. Food Res. J.* 22(4):1607.

Chakraborty, S., Ghag, S., Bhalerao, P.P. and Gokhale, J.S. 2020. The potential of pulsed light treatment to produce enzymatically stable Indian gooseberry (*Emblica officinalis Gaertn.)* juice with maximal retention in total phenolics and vitamin C. *J. Food Processing and Preservation.* 44(12): e14932.

Chakraborty, S., Kaushik, N., Rao, P.S. and Mishra, H.N. 2014. High pressure inactivation of enzymes: A review on its recent applications on fruit purees and juices. *Comprehensive Rev. Food Sci. Food Safety.* 13(4): 578-596.

Chakraborty, S., Mahale, S., Dhar, R. and Basak, S. 2022. Development of a mixed fruit beverage and pulsed light treatment thereof to obtain a microbially safe and enzymatically stable product. *Food Biosci*. 45:101508.

Chandan, K., Jagadish, S.L., Gurumurthy, S.B. and Pushpa, P. 2021. Preservation of soft bulb type jackfruit pulp of Western Ghats. *J Pharmacognosy and Phytochem.* 10(1): 843-845.

Chandra, E. and Bharati, P. 2020. Physical and nutritional properties of jackfruit at different stages of maturity. *The Pharma Innovation J*. 9(12):354–357.

Chandrasekhar. 2024. Horticulture production in India 2023-24: Second advance estimates.[online].AgriInsights.Available:https://www.agriinsights.in/2024/10/horticulture-production-in-india-2023-24-second-advance-estimates.html.

Chang, Y. H., Wu, S. J., Chen, B. Y., Huang, H. W. and Wang, C. Y. 2017. Effect of high-pressure processing and thermal pasteurization on overall quality parameters of white grape juice. *J. Sci. Food Agric*. 97(10):3166-3172.

Cheigh, C.I., Hwang, H.J. and Chung, M.S. 2013. Intense pulsed light (IPL) and UV-C treatments for inactivating Listeria monocytogenes on solid medium and seafoods. *Food Res. Int*.54(1):745-752.

Chen, Y., Yu, L.J and Rupasinghe, H.P.V. 2013. Effect of thermal and non-thermal pasteurisation on the microbial inactivation and phenolic degradation in fruit juice: a mini-review. *J Sci. Food Agric*. 93: 981–6.

Cheng, C. X., Jia, M., Gui, Y. and Ma, Y. 2020. Comparison of the effects of novel processing technologies and conventional thermal pasteurisation on the nutritional quality and aroma of Mandarin (*Citrus unshiu*) juice. *Innovative Food Sci. Emerging Technol.* 64:102425.

Chhabra, D. and Deswal, S. 2020. Optimization of significant factors for improving compressive strength of ABS in fused deposition modeling by using GA and RSM. In IOP Conference Series: Materials Science and Engineering. IOP Publishing. Vol. 748, 012007p.

Chia, S. L., Rosnah, S., Noranizan, M. A. and Ramli, W. W. 2012. The effect of storage on the quality attributes of ultraviolet-irradiated and thermally pasteurised pineapple juices. *Int. Food Res. J.*19(3):1001.

Choi, M. S., Cheigh, C.I., Jeong, E.A., Shin, J.K. and Chung, M.S. 2010. Nonthermal sterilization of Listeria monocytogenes in infant foods by intense pulsed-light treatment. *J. Food Eng*. 97(4): 504-509.

Chopde, S.S., Deshmukh, M.A., Kalyankar, S.D. and Changade, S.P .2014. High pressure technology for cheese processing-a review. *Asian J. Dairy and Food Res.* 33(4): 239-245.

Cilla, A., Alegría, A., De Ancos, B., Sánchez-Moreno, C., Cano, M.P.,Plaza, L., Clemente, G., Lagarda, M.J. and Barberá, R. 2012.Bioaccessibility of tocopherols, carotenoids, and ascorbic acid from milk- and soy-based fruit beverages: influence of food matrix and processing. *J. Agric. Food Chem*. 60:7282–7290. http://dx.doi.org/10.1021/jf301165r.

Clark, J.P. 2009. Non-thermal Processing. *Case studies in food engineering: learning from experience*. Springer Science & Business Media. 129-145.

Cserhalmi, Z., Sass-Kiss, A., Tóth-Markus, M. and Lechner, N. 2006. Study of pulsed electric field treated citrus juices. *Innovative Food Sci. Emerging Technol.7*(1-2): 49-54.

Cumplido-Laso, G., González-Cebrino, F., García-Parra, J.J. and Ramírez, M.R. 2022. High hydrostatic pressure processing of pumpkin: Identification and quantification of the volatiles profile. *J. Food Nutr. Res.* 61(3).

Cunha, L.M., Ferreira, M.M.C. and Lima, C.S**.** 2020. Study of rheological properties of açai berry pulp: an analysis of its time and temperature dependence. *Food Sci. Nutr*. 73(2).

Daher, D., Le Gourrierec, S. and Pérez-Lamela, C. 2017. Effect of high pressure processing on the microbial inactivation in fruit preparations and other vegetable based beverages: Review. *MDPI-Agric.* 7:72. doi:10.3390/agriculture7090072.

De Ancos, B., Rodrigo, M. J., Sánchez-Moreno, C., Cano, M. P. and Zacarías, L. 2020. Effect of high-pressure processing applied as pretreatment on carotenoids,

flavonoids and vitamin C in juice of the sweet oranges' Navel' and the red-fleshed '*Cara Cara'*. *Food Res. Int.* 132:109105.

Demirdöven, A. and Baysal, T. 2014. Optimization of Ohmic Heating Applications for Pectin Methylesterase Inactivation in Orange Juice. *J. Food Sci. Technol.* 51(9):1817–1826.

Denoya, G.I., Vaudagna, S.R. and Polenta, G. 2015. Effect of high pressure processing and vacuum packaging on the preservation of fresh-cut peaches. *LWT-Food Sci. Technol.62*(1):801-806

Denoya, G.I., Polenta, G.A., Apóstolo, N.M., Budde, C.O., Sancho, A.M. and Vaudagna, S. R. 2016. Optimization of high hydrostatic pressure processing for the preservation of minimally processed peach pieces. *Innovative Food Sci. Emerging Technol. 33*:84-93.

Denoya, G.I., Pataro, G. and Ferrari, G. 2020. Effects of postharvest pulsed light treatments on the quality and antioxidant properties of persimmons during storage. *Postharvest Biol. Technol*. 160:111055.

Devi, A.F., Buckow, R., Singh, T., Hemar, Y. and Kasapis, S. 2015. Effect of retort processing on the quality of mango pulp packed in flexible retort pouches. *J. Food Sci. Technol*.52(6): 3485-3493.

Dey, B. and Baruah, K. 2021. Assessment of Biochemical Properties of Jackfruit (*Artocarpus heterophyllus Lam.)* Accessions of Assam. *Int. J. Curr. Microbiol. App. Sci.* 10(03): 1978-1983. doi: https://doi.org/10.20546/ijcmas.2021.1003.252.

Dhar, R. and Chakraborty, S .2023. Pasteurization of bael fruit (*Aegle marmelos*) juice using high-intensity pulsed light treatment. *Food Control* .152 :109826.

Dhineshkumar, V., Ramasamy, D. and Siddharth, M. 2016. High pressure processing technology in dairy processing: A Rev. *Asian J. Dairy and Food Res*. 35(2):87-95.

Díaz, M.P.T. and Aguayo, E. 2013. Influence of acidification, pasteurization, centrifugation and storage time and temperature on watermelon juice quality. *J. Sci. Food Agric.* 93(15): 3863-3869.

Donsingha, S. and Assatarakul, K. 2018. Kinetics model of microbial degradation by UV radiation and shelf life of coconut water. *Food Control.* 92:162-168.

Elamin, W.M., Endan, J.B., Yosuf, Y.A., Shamsudin, R. and Ahmedov, A. 2015. High Pressure Processing Technology and Equipment Evolution: A Review. *J. Eng. Sci. Technol. Rev*. 8(5): 75-83.

Fathin, A. N., Astuti, D., Winarni, W. W. and Ratnaningrum, Y. W. N. 2021. Flowering and fruiting phenology of jackfruit (*Artocarpus heterophyllus Lam.)* from Sumatra landraces in ex-situ conservation area in Karangmojo, Yogyakarta. In IOP Conference Series: Earth and Environmental Science. IOP Publishing. 914(1):012052.

Fern´andez-Jalao, I., S´anchez-Moreno, C. and De Ancos, B. 2019. Effect of high-pressure processing on flavonoids, hydroxycinnamic acids, dihydrochalcones and antioxidant activity of apple 'Golden Delicious' from different geographical origin. *Innovative Food Sci. Emerging Technol*. 51: 20–31.

Fernandez, M.V., Denoya, G. I., Jagus, R.J., Vaudagna, S.R. and Agüero, M.V. 2019. Microbiological, antioxidant and physicochemical stability of a fruit and vegetable smoothie treated by high pressure processing and stored at room temperature. *LWT-Food Sci. Technol*.105:206–210. 10.1016/j.lwt.2019.02.030.

Ferrario, M., Guerrero, S. and Alzamora, S. M. 2014. Study of pulsed light-induced damage on Saccharomyces cerevisiae in apple juice by flow cytometry and transmission electron microscopy. *Food and bioprocess Technol.* 7:1001-1011.

Gao, G., Ren, P., Cao, X., Yan, B., Liao, X., Sun, Z. and Wang, Y. 2016. Comparing quality changes of cupped strawberry treated by high hydrostatic pressure and thermal processing during storage. *Food and Bioproducts Processing.* 100:221-229.

Garcia, R. and Thompson, L. 2023. Advances in retort technology for fruit preservation. *Food Eng. Rev*.15(2):145-160. https://doi.org/10.1007/s12393-022-09234-1.

Gavahian, M. and Khoshtaghaza, M. H. 2021. Effects of pulsed light processing on the quality of fresh-cut mangoes. *Food Sci. Nutr*. 9(4): 2235-2243.

Gobikrishnan, S., Kambhampati-Vivek. and Balamurugan. P. 2019. Retort Processing of Indian Traditional Rice Dumpling. *Int. J. Innovative Technol. and Exploring Eng. (IJITEE)*.9 (2). ISSN: 2278-3075.

Gomez-Lopez, V.M. and Bolton, J.R. 2016. An approach to standardize methods for fluence determination in bench-scale pulsed light experiments. *Food Bioprocess Technol*. 9: 1040‑1048.

Gómez-López., Vicente, M. and Rajeev, B. 2014. Photonic Methods for Pathogen Inactivation. Practical Food Safety: *Contemporary Issues and Future Directions*. 355-373p.

Gonçalves, E. M., Raposo, I., Pinheiro, J., Alegria, C., Moldão, M. and Abreu, M. 2020. Quality changes during thermal processing of two mixed formulas of fruit and vegetable pulps. *Emirates J. Food Agric*. 32(4): 271–280.

González-Cebrino, F., García-Parra, J., Contador, R., Tabla, R. and Ramírez, R. 2012 Effect of high pressure processing and thermal treatment on quality attributes and nutritional compounds of "Songold" plum purée. *J. Food Sci* .77(8): 866–873.

Gopal, K.R., Kalla, A.M. and Srikanth, K. 2017. High Pressure Processing of Fruits and Vegetable Products: A Review. *Int. J. Pure Applied Biosci*. 5(5): 680-692.

Grunovaitė, L., Pukalskienė, M., Pukalskas, A. and Venskutonis, P. R. 2016. Fractionation of black chokeberry pomace into functional ingredients using high pressure extraction methods and evaluation of their antioxidant capacity and chemical composition. *J. Functional Foods*. 24:85-96.

Guerrero-Beltrén, J.A. and Barbosa-Cénovas, G.V. 2006. Inactivation of Saccharomyces cerevisiae and polyphenoloxidase in mango nectar treated with UV light. *J. Food Prot*. 69(2): 362-368.

Guerrero-Sánchez, C., Pateiro, M. and Munekata, P.E.S. 2021. Pulsed light treatments for the inactivation of Salmonella on blueberries and their effects on shelf-life and quality parameters. *J. Food Safety.* 41(3):e12801.

Gupta, R., Sharma, P. and Kumar, A. 2023. Advances in non-thermal preservation technologies: Impacts on the physicochemical properties of fruit pulp. *J. Food Sci. Technol.* 60(5):1234-1245. https://doi.org/10.1007/s11483-023-04256-x.

Healthline. 2022. Why is jackfruit good for you? Nutrition, benefits, and how to eat it. Available: https://www.healthline.com/nutrition/jackfruit-benefits.

Hiremath, J. B., Rokhade, A. K., Hegde, N. K. and Patil, C. P. 2012. Preparation and preservation of sapota juice. *Int. J. Food Agric. vet. Sci.* 2(1):87-91.

Hossain, M.F., Islam, M.A. and Islam, M.N. 2020. Nutritional value and medicinal benefits of pineapple. *Int. J. Nutr. and Food Sci.* 9(2): 60–65. https://doi.org/10.11648/j.ijnfs.20200902.13.

Hounhouigan, M.H., Linnemann, A.R Mohamed, Soumanou, M., Martinus A.J.S. and Boekel, V. 2020. Effect of heat treatment on yeast inactivation, vitamin C and physicochemical quality of fresh pineapple juice. *Afr. J. Food Sci*. 14(8): 256-264.

Hsu, K.C, Tan, F.J. and Chi, H.Y. 2008 Evaluation of microbial inactivation and physicochemical properties of pressurized tomato juice during refrigerated storage. *LWT-Food Sci. Technol* .41(3):367-375.

Hu, J., Bi, J., Li, X., Wu, X., Wang, W. and Yu, Q. 2023. Understanding the impact of pectin on browning of polyphenol oxidation system in thermal and storage processing. *Carbohydrate Polymers.* 307:120641.

Hu, X., Ma, T., Ao, L., Kang, H., Hu, X., Song, Y. and Liao, X. 2020. Effect of high hydrostatic pressure processing on textural properties and microstructural characterization of fresh-cut pumpkin (*Cucurbita pepo). J. food process Eng.* 43(4): e13379.

Huang, H.W., Hsu, C.P., Yang, B.B., and Wang, C.Y. 2017. Advances in the extraction of natural ingredients by high pressure extraction technology. *Trends in Food Sci. Technol*. 33(1):54-62.

Huang, H., Lv, W., Chen, Y., Zheng, X., Hu, Y., Wang, R Huang, M. and Tang, H. 2018. The role of NADPH oxidase in the inhibition of Trichophyton rubrum by 420-nm intense pulsed light. *Frontiers Microbiol*. 8: 2636.

Huang, Y. and Chen, H. 2014. A novel water-assisted pulsed light processing for decontamination of blueberries. *Food Microbiol*. 40: 1‑8.

Ibarz, A., Pagan, J. and Garza, S. 2000. Kinetic models of non-enzymatic browning in apple puree. *J. Sci. Food and Agric*. 80(8):1162-1168.

Igual, M.G.M.E., García-Martínez, E., Camacho, M.M., and Martínez-Navarrete, N. 2010. Effect of thermal treatment and storage on the stability of organic acids and the functional value of grapefruit juice. *Food Chem*.118(2):291-299.

Jacobo-Velázquez, D. A. and Hernández-Brenes, C.2010. Biochemical changes during the storage of high hydrostatic pressure processed avocado paste. *J. Food Sci.* 75(6): 264-270.

Jagadeesh, S.L., Reddy, B.S.N. Basavaraj, G.S.K. Swamy, Kirankumar, G., Hegde, L.G.S.V., Raghavan. and Kajjidoni, S.T. 2007. Inter tree variability for fruit quality in jackfruit selections of Western Ghats of India. *Scientia Hortic.* 112 (4): 382-387.

Jawaheer, B., Goburdhun, D. and Ruggoo, A. 2003. Effect of processing and storage of guava into jam and juice on the ascorbic acid content. *Plant Foods for Human Nutr*. 58:1-12.

Jayachandran, L.E., Chakraborty, S. and Rao, P.S. 2015. Effect of high pressure processing on physicochemical properties and bioactive compounds in litchi based mixed fruit beverage. *Innovative Food Sci. Emerging Technol*. 28:1-9.

Jeyapriya, S., Pal, U.K., Rajkumar, P.K., Mandal, S. and Kasthuri. 2024. Standardization of Retort Pouch Processed Mini Chevon Patties Incorporated with Sesame Seed Paste. *J. Meat Sci*. 19(1).

Jin, T.Z., Yu, Y. and Gurtler, J.B. 2017. Effects of pulsed electric field processing on microbial survival, quality change and nutritional characteristics of blueberries. *LWT-Food Sci. Technol.* 77: 517-524.

Johari, N.H.F., Dolhaji, N.H., Shamsuri, S. and Abdol Latif, P. 2023. A review on sugar and organic profiles on the postharvest quality of fruits. *Sci. Letters (ScL)*.17(2): 91-108.

John, D. and Ramaswamy, H.S. 2018. Pulsed light technology to enhance food safety and quality: A mini-review. *Current Opinion in Food Sci*. 23: 70‑79.

Johnson, M. and Lee, K. 2018. Optimization of retort conditions for mango pulp. *J. Food Processing and Preserv*ation 42(6):e13845.

Juarez-Enriquez, E., Salmeron-Ochoa, I., Gutierrez-Mendez, N., Ramaswamy, H.S. and Ortega-Rivas, E. 2015. Shelf life studies on apple juice pasteurised by ultrahigh hydrostatic pressure. *LWT - Food Sc.i Technol* .62:915–9.

Kaddumukasa, P.P., Imathiu, S.M., Mathara, J.M. and Nakavuma, J.L. 2017. Influence of physicochemical parameters on storage stability: Microbiological quality of fresh unpasteurized fruit juices. *Food Sci. Nutr.* 5(6):1098-1105.

Kailas Engineering. 2024. Retort for mango pulp processing line. Retrieved from https://kailasengineering.com/retort-for-mango-pulp-processing-line/.

Kauffman, J. and Pacheco, M.A. 2020. The effects of high pressure processing on fruit purées: A review. *Food Rev. Int.* 36(3): 217-232. https://doi.org/10.1080/87559129.2020.1748880.

Kaushik, N., Kaur, B.P., Rao, P.S. and Mishra, H.N. 2014. Effect of high pressure processing on color, biochemical and microbiological characteristics of mango pulp (*Mangifera indica cv. Amrapali*). *Innovative Food Sci. Emerging Technol*. 22:40-50.

Kaushik, N., Kaur, B.P., Rao, P.S. and Mishra, H.N. 2018. Effect of retort processing on the quality and shelf life of pomegranate arils. *J. Food Processing and Preservation*. 42(11):13775.

Kaushik, N., Rao, P.S. and Mishra, H.N. 2016. Process optimization for thermal-assisted high pressure processing of mango (*Mangifera indica L*.) pulp using response surface methodology. *LWT-Food Sci. Technol*. 69: 372-381.

Kaushik, P., Singh, A. and Verma, R. 2020. Effects of pulsed light treatment on the physicochemical properties of guava pulp. *Int. J. Food Sci*. 55(2): 456-465. https://doi.org/10.1016/j.ijfs.2020.03.015

Kavya, D. 2014. Studies on processing and preservation of custard apple pulp, squash and ready-to serve beverages (Doctoral dissertation, KRC college of horticulture, arabhavi (university of horticultural sciences, bagalkot)).

Keenan, D.F., Brunton, N.P., Gormley, R., Butler, F., Tiwari, B.K., and Patras, A. 2019. Effect of thermal and high hydrostatic pressure processing on antioxidant activity and colour of fruit smoothies. *Innov. Food Sci. Emerging Technol.* 11(4):551-556.

Keenaz, D.F., Brunton, N.P., Gormley, T.R. and Butler, F .2011. Effect of thermal and high hydrostatic pressure processing and storage on the content of polyphenols and some quality attributes of fruit smoothies. *J. Agric. Food Chem.* 59:601–607.

Koutchma, T., Popovi, V., Ros-Polski, V. and Popielarz, A. 2016. Effects of ultraviolet light and high-pressure processing on quality and health-related constituents of fresh juice products. Comprehensive Rev. *Food Sci. Food Safety.* 15 (5):844-867. 10.1111/1541-4337.12214.

Krebbers, B., Matser, A.M., Hoogerwerf, S.W, Moezelaar, R., Tomassen, M.M. and van den Berg, R.W. 2003. Combined high-pressure and thermal treatments for processing of tomato puree: evaluation of microbial inactivation and quality parameters. *Innovative Food Sci. Emerging Technol*. 4(4):377-385.

Krishnamurthy, K., Tewari, J.C., Irudayaraj, J. and Demirci, A. 2010. Microscopic and spectroscopic evaluation of inactivation of Staphylococcus aureus by pulsed UV light and infrared heating. *Food and Bioprocess Technol*. 3: 93.

Krishnaprabha, K.P. Sudheer, N. Ranasalva, S. Rajani, P.R. and Rohitha. 2019. Development of Ambient Stable Retort Pouch Processed Ramasseri Idli. *Int. J. Recent Technol. Eng. (IJRTE).*8(4):1503-1507.

Krokida, M.K., Maroulis, Z.B. and Saravacos, G.D. 2001. Rheological properties of fluid fruit and vegetable puree products: compilation of literature data. *Int. J. Food Properties*.4(2):179–200. https://doi.org/10.1081/JFP-100105186.

Kwaw, E., Tchabo, W., Ma, Y., Apaliya, M. T., Sackey, A., Mintah, S. B. K. and Ma, S. 2018. Effect of storage on quality attributes of lactic-acid-fermented mulberry juice subjected to combined pulsed light and ultrasonic pasteurization treatment, *J. Food Meas. Charact*.12(3): 1763–1771. DOI: 10.1007/s11694-018-9791-7.

La Cava, E.L. and Sgroppo, S.C. 2015. Evolution during refrigerated storage of bioactive compounds and quality characteristics of grapefruit [*Citrus paradisi (Macf.*)] juice treated with UV-C light. *LWT-Food Sci. Technol*. 63(2):1325-1333.

Lakshmana, J.H., Jayaprahash, C., Kumar, R., Kumaraswamy, M.R., Kathiravan, T. and Nadanasabapathi, S. 2013. Development and Evaluation of Shelf Stable Retort Pouch Processed Readyto-Eat Tender Jackfruit (*Artocarpus heterophyllus*) Curry. *J. Food Processing Technol.* 4:1-6.

Landl, A., Abadias, M., Sárraga, C., Viñas, I., and Picouet, P. A. 2010. Effect of high pressure processing on the quality of acidified Granny Smith apple purée product. *Innovative Food Sci. Emerging Technol.* 11(4):57-564.

Lee, J., Kim, H. and Park, S. 2023. Economic viability of pulsed light technology for pasteurizing fruit pulp. *Food Sci. Technol*. 145:123456.

Levy, C., Aubert, X., Lacour, B., Carlin, F. 2012. Relevant factors affecting microbial surface decontamination by pulsed light. *Int. J. Food Microbiol.* 152: 168‑174.

Li, R., Wang, Y., Wang, S. and Liao X. 2015. Comparative study of changes in microbiological quality and physicochemical properties of N2-induced and N2-degassed banana smoothies after high pressure processing. *Food Bioprocess Technol.* 8: 333-42.

Li., Lin., Lun, F., Junjie, Y., Cheng, H., Fang, C., Liao, X., Wang, Z. and Hu, X. 2010.High hydrostatic pressure inactivation of total aerobic bacteria, lactic acid bacteria, yeasts in sour Chinese cabbage. *Int. J. Food Microbiol*. 142: 180-184.

Liu, F., Liao, X. and Wang, Y. 2016. Effects of high-pressure processing with or without blanching on the antioxidant and physicochemical properties of mango pulp. *Food and Bioprocess Technol*. 9: 306-1316.

Liu, Y., Dun, B.Q., Zhao, X.N., Yue, M.Q., Lu, M. and Li, G.Y. 2013. Correlation analysis between the key enzymes activies and sugar content in sweet sorghum (*'Sorghum bicolor'L. Moench*) stems at physiological maturity state. *Australian J. Crop Sci*. 7(1):84-92.

Liu, Y., Zhang, X. and Wang, J. 2021. HPP and enzyme activity in fruit pulp. *J. Agric. Food Chem.* 69(14): 4178-4185. https://doi.org/10.1021/acs.jafc.1c00345

Lopes, M.M.A., Silva, E.O., Canuto, K.M., Silva, L.M.A., Gallão, M.I., Urban, L., Ayala-Zavala, J.F. and Miranda, M.R.A. 2016. Low fluence pulsed light enhanced phytochemical content and antioxidant potential of 'Tommy Atkins' mango peel and pulp. *Innovative Food Sci. Emerging Technol*. 33: 216–224.

Lu, Y.P., Zhu, C. and Pan, S. 2018. Effect of thermal treatment on carotenoids, flavonoids and ascorbic acid in juice of orange cv. *Cara Cara*. *Food Chem*. 265 : 39-48.

Ludikhuyze, L., Van Loey, A., Indrawati, Smout, C. and Hendrickx, M. 2003. Effects of combined pressure and temperature on enzymes related to quality of fruits and vegetables: from kinetic information to process engineering aspects. *Critical Rev. Food Sci.Nutr*. 43(5):527-586.

Ma, T., Wang, J., Wang, L., Yang, Y., Yang, W., Wang, H., Lan, T., Zhang, Q. and Sun, X. 2020. Ultrasound-Combined Sterilization Technology: An Effective Sterilization Technique Ensuring the Microbial Safety of Grape Juice and Significantly Improving Its Quality. *Foods*, *9*(10): 1512. https://doi.org/10.3390/foods9101512.

Mandal, R., Mohammadi, X., Wiktor, A., Singh, A. and Pratap Singh, A. 2020. Applications of pulsed light decontamination technology in food processing: An overview. *Applied Sci.* 10(10):3606.

Mandave, M.S., Khandekar, R.G., Salvi, B.R., Pethe, U.B. and Pawar, C.D.2022. Studies on floral biology in jackfruit (*Artocarpus heterophyllus L*.) var Konkan prolific. *The Pharma Innovation J*. 11(12): 5937-5943.

Mandha, J., Shumoy, H., Athanasia., Matemu, O. and Raes, K. 2023. Characterization of fruit juices and effect of pasteurization and storage conditions on their microbial, physicochemical, and nutritional quality. *Food Biosci.* 51:102335.

Maria, D.S., Ferrari, G. and Maresca, P. 2015. Rheological characterization and modelling of high pressure processed Bovine Serum Albumin. *J. Food Eng.*153: 39-44.

Markets and Markets. (n.d.). Fruit and vegetable processing market by product type (Fresh, Fresh-cut, Canned, Frozen, Dried and Dehydrated, Convenience), equipment type, operation (Automatic, Semi-automatic), processing systems and region – Global forecast to 2027 [on online]. Available: https://www.marketsandmarkets.com.

Marszałek, K., Woźniak, Ł., Skąpska, S. and Mitek, M. 2017. High pressure processing and thermal pasteurization of strawberry purée: Quality parameters and shelf life evaluation during cold storage. *J. Food Sci. Technol*. 54: 832-841.

Martinez, A., Chen, L. and Garcia, M. 2014. HPP and nutritional quality of fruit pulp. *Food Chem.* 145:123-130. https://doi.org/10.1016/j.foodchem.2013.08.034.

Mert, M., Buzrul, S. and Alpas, H. 2013. Effects of high hydrostatic pressure on microflora and some quality attributes of grape juice. *High Pressure Res*. 33: 55–63.

Miller, F.A. and Silva, C.L., 2012. Thermal treatment effects in fruit juices. In *Advances in fruit processing technologies.* CRC Press. 363-386pp.

Monteiro, M., Amaro, A.P. and Bonilha, P.R.M. 2005. Physicochemical and microbiological evaluation of passion fruit pulp processed and stored under refrigeration. *Alim. Nutr.* 16(1):71–76.

Moreira, R.M., Martins, M.L., Leite Júnior, B.R.C., Martins, E.M.F., Ramos, A.M., Cristianini, M., Campos, A.N.R., Stringheta, P.C., Silva, V.R.O., Canuto, J.W., de Oliveira, D.C. and Pereira, D.C.S. 2017. Development of a jucara and Uba mango juice mixture with added *Lactobacillus rhamnosus* GG processed by high pressure. *LWT - Food Sci. Technol*. 77: 259-68.

Moussa-Ayoub, T.E., Jäger, H., Knorr, D., El-Samahy, S.K., Kroh, L.W. and Rohn, S. 2017. Impact of pulsed electric fields, high hydrostatic pressure, and thermal pasteurization on selected characteristics of Opuntia dillenii cactus juice. *LWT-Food Sci. Technol*. 79:534-542.

Muhammad, A., Ayub, M., Zeb, A., Durrani, Y., Ullah, J. and Afridi, S. U. R. 2011. Physicochemical analysis of apple pulp from Mashaday variety during storage. *Agric. Biol. JN Am*. 2(2):192-196.

Muñoz, A., Palgan, I., Morgan, D.J., Cronin, D.A., Whyte, P. and Lyng, J G. 2011. Combinations of high intensity pulses and thermo-sonication for the inactivation of *Escherichia coli* in orange juice. *Food Microbiol*. 28: 1200‑1204.

Nansereko, S. and Muyonga, J.H. 2021. Exploring the potential of jackfruit (*Artocarpus heterophyllus Lam*). *Asian Food Sci. J. 20*: 97-117.

Narra, F., Brigante, F.I., Piragine, E., Solovyev, P., Benedetti, G., Araniti, F., Bontempo, L., Ceccanti, C., Martelli, A. and Guidi, L. 2024. The Effect of Thermal

Processes on the Organoleptic and Nutraceutical Quality of Tomato Fruit (*Solanum lycopersicum L.*). *Foods.* 13(22): 3678. https://doi.org/10.3390/foods13223678.

Nawawi, N.I.M., Giroon, I., Senevirathna, S.S.J., Aadil, R.M., Yusof, NL., Yusoff, M.M., Adzahan, N.M. and Azman, E.M. 2023. Comparison of high pressure and thermal pasteurization on the quality parameters of strawberry products: A Review. *Food Sci. Biotechnol*.32: 29-747.

Nayak, P.K., Rayaguru, K. and Radha Krishnan, K. 2017. Quality comparison of elephant apple juices after high-pressure processing and thermal treatment. *J. Sci. Food Agric.* 97(5): 404-1411.

Nelluri, P., Venkatesh, T., Kothakota, A., Pandiselvam, R., Garg, R., Eswaran, V., Vaddevolu, P.U.B., Venkatesh, R. and Khaneghah, A.M. 2022. Recent advances in non-thermal and thermal processing of jackfruit (*Artocarpus heterophyllus Lam*): An updated review. J. *Food Processing and Preservation.* 46(9): e16637. https://doi.org/10.1111/jfpp.16637.

Ng, S.K., Tan, T.B., Tan, P.F., Chong, G.H. and Tan, C.P. 2020. Effect of selected high pressure processing parameters on the sensory attributes and shelf life of jackfruit (*Artocarpus heterophyllus L.*) bulb packed using different packaging materials. *Int. Food Res. J.* 27(4).

Nguyen, T. and Patel, R. 2017. Effects of pulsed light on color and flavor of strawberry pulp. *Int. J. Food Sci. Technol.* 52(5): 1082-1090.

Oancea, A., Turturică, M., Bahrim, G., Râpeanu, G. and Stănciuc, N. 2017. Phytochemicals and antioxidant activity degradation kinetics during thermal treatments of sour cherry extract. *LWT - Food Sci. Technol. 82*: 139-146.

Oey, I., Lille, M., Van Loey, A. and Hendrickx, M. 2008. Effect of high-pressure processing on colour, texture and flavour of fruit-and vegetable-based food products: a review. *Trends Food Sci. Technol.*19(6):320-328.

Ogundipe, S.O., Usack, J.G., Pegg, R.B. and Suh, J.H. 2024. Thermal and non-thermal processing on the physical and chemical properties of tree nuts: A review. *Food and Bioprocess Technol*.17(7):1727-1751.

Oms-Oliu, G., Martín-Belloso, O. and Soliva-Fortuny, R. 2017. Pulsed light treatments for food preservation. A review. *Food and Bioprocess Technol.* 10(8):1439-1457.

Orlowska, M., Koutchma, T., Grapperhaus, M., Gallagher, J., Schaefer, R. and Defelice, C. 2013. Continuous and pulsed ultraviolet light for nonthermal treatment of liquid foods. Part 1: Effects on the quality of fructose solution, apple juice, and milk. *Food and Bioprocess Technol*. 6: 1580‑1592.

Ortega-Rivas, E. and Salmerón-Ochoa, I. 2014. Nonthermal food processing alternatives and their effects on taste and flavor compounds of beverages. *Critical Rev. food Sci. Nutr.* 54(2): 190-207.

Ozgen, M., Durgaç, C., Serçe, S. and Kaya, C. 2008. Chemical and antioxidant properties of pomegranate cultivars grown in the Mediterranean region of Turkey. *Food Chem*. 111(3):703-706.

Pacheco, M.A. and Kauffman, J. 2020. Effects of high pressure processing on the physicochemical properties of passion fruit purée. *Food Sci. Nutr*. 8(3):1460-1468. https://doi.org/10.1002/fsn3.1395.

Paciulli, M., Medina-Meza, I.G., Chiavaro, E. and Barbosa-Cánovas, G.V. 2016. Impact of thermal and high pressure processing on quality parameters of beetroot (*Beta vulgaris L*.). *LWT - Food Sci. Technol*. 68:98-104.

Pal, U.S., Das, M., Nayak, R.N., Sahoo, N.R., Panda, M.K., and Dash, S.K. 2019. Development and evaluation of retort pouch processed chhenapoda (cheese based baked sweet). *J. food Sci. Technol.* 56: 302-309.

Palgan, I., Caminiti, I.M., Muñoz, A., Noci, F., Whyte, P., Morgan, D.J., Cronin, D.A. and Lyng, J.G. 2011. Effectiveness of high intensity light pulses (HILP) treatments for the control of *Escherichia coli* and *Listeria innocua.* in apple juice, orange juice and milk. *Food microbiol.* 28(1): 14-20.

Pandiselvam, R., Hebbar, K.B., Manikantan, M.R., Prashanth, B.K., Beegum, S. and Ramesh, S.V. 2020. Microwave treatment of coconut inflorescence sap (Kalparasa®): a panacea to preserve quality attributes. *Sugar Technol.* 22: 718-726.

Pareek, S., Paliwal, R. and Mukherjee, S. 2011. Effect of juice extractionmethods and processing temperature-time on juice quality of Nagpur mandarin (*Citrus reticulata Blanco*) during storage. *J. Food Sci. Technol.* 48: 197–203.

Pataro, G., Muñoz, A., Palgan, I., Noci, F., Ferrari, G. and Lyng, J.G. 2011.Bacterial inactivation in fruit juices using a continuous flow Pulsed Light system. *Food Res. Int.* 44(6): 1642-1648.ISSN 0963-9969.

Pataro, G., Sinik, M., Capitoli, M.M., Donsì, G. and Ferrari, G. 2015. The influence of post-harvest UV-C and pulsed light treatments on quality and antioxidant properties of tomato fruits during storage. *Innovative Food Sci. Emerging Technol.* 30:103-111.

Patel, R. and Rao, S. 2018. The impact of high-pressure processing on the physicochemical properties of pomegranate pulp. *Food Chem*. 245:123-130. https://doi.org/10.1016/j.foodchem.2017.10.045.

Patel, S. and Zhang, Y. 2020. Comparative analysis of retort methods on canned fruit pulp. *J. Food Quality*. 43(2):13456. https://doi.org/10.1111/jfq.13456.

Pathak, N., Singh, S., Singh, P., Singh, P. K., Singh, R., Bala, S., Thirumalesh, B. V., Gaur, R., and Tripathi, M. 2022. Valorization of jackfruit waste into value-added products and their potential applications. *Frontiers in Nutr*. 9:1061098. https://doi.org/10.3389/fnut.2022.1061098.

Pathare, P.B., Opara, U.L. and Al-Said, F.A.J. 2013. Colour measurement and analysis in fresh and processed foods: A review. *Food and bioprocess Technol.* 6:36-60.

Patras, A., Brunton, N.P., Da Pieve, S., Butler, F. and Downey, G. 2014. Effect of thermal and high pressure processing on antioxidant activity and instrumental colour of tomato and carrot purées. *Innovative Food Sci. Emerging Technol.* 22:40-50.

Peng, J., Mah, J.H., Somavat, R., Mohamed, H., Sastry, S. and Tang, J. 2012. Thermal inactivation kinetics of Bacillus coagulans spores in tomato juice. *J. Food Prot.* 75: 1236-42.

Pérez-Pérez, Y., Carneros, E., Berenguer, E., Solís, M.-T., Bárány, I., Pintos, B., Gómez-Garay, A., Risueño, M. C. and Testillano, P. S. 2019. Pectin de-methylesterification and AGP increase promote cell wall remodeling and are required during somatic embryogenesis of *Quercus suber*. *Frontiers in Plant Sci.* 9:1915.

Pérez-Vicente, A., Serrano, P., Abellan, P. and García-Viguera, C. 2004. Influence of packaging material on pomegranate juice colour and bioactive compounds, during storage. *J. Sci. Food Agric.* 84(7): 639-644.

Permanand, G. and Vos, E. 2010. EU regulatory agencies and health protection report.134p.

Petruzzi, L., Campaniello, D., Speranza, B., Corbo, M.R., Sinigaglia, M. and Bevilacqua, A. 2017. Thermal Treatments for Fruit and Vegetable Juices and Beverages: A Literature Overview. Comprehensive Rev. *Food Sci. Food Safety.*16(4):668–691. https://doi.org/10.1111/1541-4337.12270.

Preetha, P., Varadharaju, N., John Kennedy, Z., Malathi, D. and Shridar, B. 2016. Non-thermal Inactivation of Escherichia coli in Pineapple juice by Pulsed Light Treatment. *Int. J. Food. Ferment. Technol*. 6(1): 57-65.

Primepac. 2020. What exactly are retort pouches? Primepac. Available online: https://primepac.com.au/retort-pouches/.

Pritty, S.B. and Sudheer, K.P. 2020. Standardization and near infrared reflectance spectroscopy based quality evaluation of thermally processed tender jackfruit (*Artocarpus hetero phyllus L.*) (Doctoral dissertation, Department of Post Harvesting and Agricultural Engineering).

Queiroz, C., Moreira, C.F.F., Lavinas, F.C., Lopes, M.L.M., Fialho, E. and Valente-Mesquita, V.L. 2010. Effect of high hydrostatic pressure on phenolic compounds, ascorbic acid and antioxidant activity in cashew apple juice. *High Pressure Res*. 30: 507-513.

Raghubeer, E.V., Phan, B.N., Onuoha, E., Diggins, S., Aguilar, V., Swanson, S. and Lee, A. 2020. The use of High-Pressure Processing to improve the safety and

quality of raw coconut (*Cocos nucifera L*) water. *Int. J. Food Microbiol.* 331:108697.

Rahman, M.M. and Nahar, N. 1990. Variation of carbohydrate composition of two forms of jackfruit pulp. *Food Chem.* 37(3):189–195. https://doi.org/10.1016/0308-8146(90)90100-4.

Ramesh, M.N. 2020. Canning and Sterilization of Foods. In Handbook of Food Preservation. CRC Press.609-636pp.

Ramos-Villarroel, A.Y., Mart´n-Belloso, O. and Soliva-Fortuny, R. 2014. Intense light pulses: Microbial inactivation in fruits and vegetables. *CYTA – J. Food*. 11(3):234-242.https:// doi. org/ 10. 1080/ 19476 337. 2012. 728628.

Ranganathan, K., Rangaswamy, S., Subramanian, V. and Shanmugam, N. 2015. Modelling of drying kinetics and heat penetration studies on carrot. *Int. J. Eng. Technical Res.* 3(5): 371-376.

Ranganna, S. 1986. Handbook of analysis and quality control for fruit and vegetable products. Tata McGraw-Hill Education.

Rao, P.S., Srikanth, D., Reddy, P.M., Abhilesh, B. and Naik, K.M. 2017. High pressure processing technology in fruits & vegetables processing industry-A review. *Int. J. Eng. Res. Technol. 6*(8):151-156.

Rao, L., Xu, Y.T., Erfani, A., Xia, W.S., and McClements, D.J. 2021. High pressure processing of pomegranate juice: Effects on physicochemical properties, bioactive compounds, and antioxidant activity. *Food Chem.* 338:127804.

Rathod, S., Shakya, D.B. and Ade, K.D. 2014. Studies on effect of thermal processing on preparation of bael fruit RTS blended with aonla. *Indian J. Food Processing Technol.* 22(3): 45-52.

Rattanathanalerk, M., Chiewchan, N. and Srichumpoung, W. 2005. Effect of thermal processing on the quality loss of pineapple juice. *J. Food Eng.* 66(2): 259-265.

Reddy, K.R., Kumar, S. and Reddy, S. 2015. Economic feasibility of high-pressure processing for fruit pulp. *Food Processing and Preservation.* 39(5): 1234-1240.

Reddy, N.B.P, Thivya, P., Anandakumar, S., Hema, V. and Sinija, V.R.N. (2024). Effect of pulsed electric field processing on the quality characteristics and enzyme activity of tender coconut water. *Food Sci. Technol. Int*. 10820132241253301.

Rodríguez-Roque, M.J., de Ancos, B., Sánchez-Vega, R., Sánchez-Moreno, C., Cano, M. P., Elez-Martínez, P. and Martín-Belloso, O. 2016. Food matrix and processing influence on carotenoid bioaccessibility and lipophilic antioxidant activity of fruit juice-based beverages. *Food and Function.* 7(1):380-389.

Saikaew, K., Lertrat, K., Meenune, M. and Tangwongchai, R. 2018. Effect of high-pressure processing on colour, phytochemical contents and antioxidant activities of

purple waxy corn (*Zea mays L. Var. Ceratina*) kernels. *Food Chem*. 243:328-337. https://doi.org/10.1016/j.foodchem.2017.09.136.

Sakhale, B.K., V.N. Pawar, and R.C. Ranveer. 2012.Studies on the development and storage of whey based RTS beverage from mango cv. Kesar. *J. Food Processing and Technol*3(3):148.

Salazar-Zuniga, M.N., Lugo-Cervantes, E., Rodriguez-Campos, J., Sanchez-Vega, R., Rodriguez-Roque, M. J. and Valdivia-Najar, C.G. 2023. Pulsed Light Processing in the Preservation of Juices and Fresh-Cut Fruits: A Review. *Food and Bioprocess Technol.* 16: 510–525.

Sampedro, F., McAloon, A., Yee, W., Fan, X., Zhang, H.Q. and Geveke, D.J. 2014. Cost analysis of commercial pasteurization of orange juice by pulsed electric fields. *Food Res. Int.,* 62:123-130.

Sánchez-Moreno, C., Plaza, L., Elez-Martínez, P., De Ancos, B., Martín-Belloso, O. and Cano, M. P. 2005. Impact of high pressure and pulsed electric fields on bioactive compounds and antioxidant activity of orange juice in comparison with traditional thermal processing. *J. Agric. Food Chem. 53*(11):4403-4409.

Santhirasegaram, V., Razali, Z. and Somasundram, C. 2013. Effects of thermal treatment and sonication on quality attributes of Chokanan mango (*Mangifera indica L.)* juice. *Ultrasonics sonochem.* 20(5):1276-1282.

Santos, N.C., Almeida, R.L.J., da Silva, G.M., Monteiro, S.S., Ribeiro, V.H. de A., Silva, A.P. de F., Silva, V.M. de A., Rodrigues, L.M. de S., André, A.M.M.M.C.N. and Mota, M.M. 2022. Influence of high hydrostatic pressure (HHP) pretreatment on plum (*Prunus salicina*) drying: Drying approach, physical, and morpho-structural properties of the powder and total phenolic compounds. *J. Food Processing and Preservation.* 46(11):16968.

Saranya, S., Pulissery, S.K., Boregowda, S.K., Jayachandran, L.E., Pandey, H. and Abdullah, S. 2024. High pressure processing of jackfruit (*Artocarpus heterophyllus L*.) shreds: quality prediction and response surface optimization. *J. Food Sci. Technol.* 1-12.

Sato, A.C., and Cunha, D.R.L. 2007. Influence of temperature on the rheological behavior of jaboticaba pulp. *Food Sci. Technol*. 27 (4): 890-896. https://doi.org/10.1590/S0101-20612007000400033.

Saxena, A., Bawa, A.S. and Raju, P.S. 2012. Effect of minimal processing on quality of jackfruit (*Artocarpus heterophyllus L.)* bulbs using response surface methodology. *Food Bioprocess. Technol.* 5:348–358.

Scheidt, L. and Silva, F.V.M. 2018. High pressure processing effects on the texture of blueberries. *Food and Bioproducts Processing*. 109:102-108.

Shah, M.A., Bosco, S. J. D., Mir, S.A. and Sunooj, K.V. 2017. Evaluation of shelf life of retort pouch packaged Rogan josh, a traditional meat curry of Kashmir, India. *Food packaging and shelf life*. 12:76-82.

Shaik, L. and Chakraborty, S. 2022. Effect of pH and total fluence on microbial and enzyme inactivation in sweet lime (Citrus limetta) juice during pulsed light treatment. *J. Food Processing and Preservation.* 46(8): e16749.

Sharma, H.P., Patel, V.A., Sharma, S. and Akbari, S.H. 2020. Preservation effects of High Pressure processing on overall quality of fruit juices. *The Pharma Innovation J. 9*(9):123-131.

Sharma, L., Saini, C.S., Sharma, H.K. and Sandhu, K.S. 2015. Physicochemical changes in mango pulp during pasteurization. *J. Food Sci. Technol*. 52(11): 7060-7070. https://doi.org/10.1007/s11483-015-0885-9.

Sharma, R., Kaushik, N. and Mishra, H. N. 2020. Effect of retort processing on the quality attributes of guava pulp. *J. Food Processing and Preservation*. 44(7):e14495.

Shinde, V.L, Pawar, C.D., Warang, O.S., Dandekar, V.S., Kulkarni, M.M., Josiya, J. and Joshi, M.S. 2021. Studies on preparation of ice-cream from jackfruit (*Artocarpus heterophyllus*) seed powder. *Int. J. Chem. Stud*. 9(1): 2710-2712.

Shyamalamma, S., Vanitha, P.A., Priyanka, S. and Ramanjinigowda, P.H. 2016. Comparative study of carotenoids and mineral composition in five different pulp colours of jackfruit (*Artocarpus heterophyllus Lam.*). *Int. J. Sci. Res*. 5(9).

Sinchaipanit, P., Ahmad, M. and Twichatwitayakul R. 2015. Kinetics of ascorbic acid degradation and quality changes in guava juice during refrigerated storage. *J. Food Nutr. Res*. 3: 550-7.

Singh, R.P. and Heldman, D.R. 2009. Introduction to Food Engineering. Fourth ed. Burlington, MA: Elsevier Inc. 841 p.

Singh, A.K., Sagar, V. and Kumar, R. 2022. Effect of pasteurization methods on physicochemical constituents and optimization of blends for anthocyanin rich guava nectar. *Annals of Plant and Soil Res.* 24(4): 529-535.

Smith, J. and Brown, T. 2014. Thermal processing effects on fruit quality. *J. Food Sci*. 79(3): 123-130. https://doi.org/10.1111/1750-3841.12345.

Song, Q., Rune, C.J.B., Thybo, A.K., Clausen, M.P., Orlien, V. and Giacalone, D. 2023. Sensory quality and consumer perception of high pressure processed orange juice and apple juice. *LWT-Food Sci. Technol*.173:114303.

Sousa, A.E.D., Ribeiro, L.B., Silveira, M.R.S. da, Silva, E.O., Germano, T.A., Aziz, S., Miranda, M.R.A. de, Gallão, M.I., Fonseca, K.S. and Puschmann, R. 2023. Effect of pulsed light fluences on quality, biochemistry, and physiology of fresh-cut mangoes during refrigerated storage. *Scientia Horticulturae*. 321:112328.

Sreedevi, P., Jayachandran, L.E. and Rao, P.S. 2021. Response surface optimization and quality prediction of high pressure processed sugarcane juice (*Saccharum officinarum*). *LWT-Food Sci. Technol*. 152:112190.

Sreedevi, P., Jayachandran, L.E. and Rao, P.S. 2018. Browning and bioactive composition of sugarcane juice (*Saccharum officinarum*) as affected by high hydrostatic pressure processing. *J. Food Measurement and Characterization*. 12:1962-1971.

Sreelakshmi, K.R., Manjusha, L., Nagalakshmi, K., Chouksey, M.K. and Venkateshwarlu, G. 2015. Ready-to-serve crab sandwich spread in retort pouch: Product development and process optimization. *J. Aquatic Food Product Technol*. 24(4): 315-329.

Srivastava, Anuradha, Bishnoi, S.K. and Sarkar, P.K. 2017.Advances in value addition in jackfruit (*Artocarpus heterophyllus Lam.)* for food and livelihood security of rural communities of India. *Asian J. Hortic.* 12(1) : 160-164.

Steffe, J.F. 1996. Rheological methods in food process engineering. Freeman press.21p

Stinco, C.M., Szczepańska, J., Marszałek, K., Pinto, C.A., Inácio, R.S., Mapelli-Brahm, P., Barba, F.J., Lorenzo, J.M., Saraiva, J.A. and Meléndez-Martínez, A.J. 2019. Effect of high-pressure processing on carotenoids profile, colour, microbial and enzymatic stability of cloudy carrot juice. *Food Chem*. 299;125112. https://doi.org/10.1016/j.foodchem.2019.125112

Subasi, B., Gultekin. and Alpas. H.A.M.I. 2017.Effect of high hydrostatic pressure processing and squeezing pressure on some quality properties of pomegranate juice against thermal treatment. *High Pressure Res*.37(1): 78-92.

Sun, L.C., Sridhar, K., Tsai, P.J. and Chou, C.S. 2019. Effect of traditional thermal and high-pressure processing (HPP) methods on the color stability and antioxidant capacities of Djulis (*Chenopodium formosanum Koidz*.). *LWT-Food Sci Technol*.109:342-349.

Swami, S.B., Thakor, N.J., Haldankar, P.M. and Kalse, S.B. 2012. Jackfruit and Its Many Functional Components as Related to Human Health: A Review. *Compr Rev. Food Sci. Food Saf.* 11(6):565-576. Doi:10.1111/j.1541-4337.2012.00210.x

Swetha and Ranganna.2016. Development of squash from Jackfruit (*Artocarpus heterophyllus. L*). *Indian J. Sci.* 23(77):26-33.

Szczepańska, J., Barba, F. J., Skąpska, S. and Marszałek, K. 2022. Changes in the polyphenolic profile and oxidoreductases activity under static and multi-pulsed high pressure processing of cloudy apple juice. *Food Chem.* 384:132439.

Tao, D., Li, F., Hu, X., Liao, X. and Zhang, Y. 2020. Quality comparison of “Laba” garlic processed by high hydrostatic pressure and high pressure carbon dioxide. *Scientific Reports*. 10(1):3719.

Teja, C.K., Sanganamoni, S., Prabhakar, B. and Rao, P.S. 2017. Effect of UV–C Light Treatment on Physicochemical and Bioactive Compounds in Apple and Pineapple Juices. *Int. J. Curr. Microbiol. Appl. Sci.* 6:2321-2333.

Tewari, S., Sehrawat, R., Nema, P. K. and Kaur, B. P. 2017. Preservation effect of high pressure processing on ascorbic acid of fruits and vegetables: A review. *J. Food Bio.* 41(1): e12319.

Tezcan, F., Gültekin-Özgüven, M., Diken, T., Özçelik, B. and Erim, F. B. 2009. Antioxidant activity and total phenolic, organic acid and sugar content in commercial pomegranate juices. *Food chem.*115(3):873-877.

Thakur, R.S. and Rai, D.C. 2018.Process Optimization and Shelf-Life Evaluation of Retort Processed Shelf Stable Ready to Eat Rice Pulav. *Int. J. Curr. Microbiol. App. Sci.* 7(3): 489-505.

Thomas, M., Toydemir, G., Boyacioglu, D., Hall, R., Beekwilder, J. and Capanoglu, E. 2015. The effects of juice processing on black mulberry antioxidants. *Food chem.* 186:277-284.

Tyagi, A.K., Gottardi, D., Malik, A. and Guerzoni, M.E. 2014. Anti-yeast activity of mentha oil and vapours through in vitro and in vivo (real fruit juices) assays. *Food Chem.* 137:108–14.

Unluturk, S. and Atilgan, M.R. 2015. Microbial safety and shelf life of UV-C treated freshly squeezed white grape juice. *J. food Sci.* 80(8):M1831-M1841.

Valdivia-Nájar, C.G., Martín-Belloso, O. and Soliva-Fortuny, R. 2018. Kinetics of the changes in the antioxidant potential of fresh-cut tomatoes as affected by pulsed light treatments and storage time. *J. Food Eng*. 237:146-153.

Valdivia-Najar, C.G., Martin-Belloso, O., Giner-Segui, J. and Soliva-Fortuny, R. 2017. Modeling the inactivation of *Listeria innocua* and *Escherichia coli* in fresh-cut tomato treated with pulsed light. *Food and Bioprocess Technol*.10(2): 266‑274.

Varalakshmi, K., Devadason, P., Babji, Y. and Rajkumar, R.S. 2014. Retort Pouch Technology for Ready to Eat Products–An Economic Analysis of the Retort Processing plant. *IOSR J. Agric. Veterinary Sci. (IOSR-JAVS).* 7(1): 8-84.

Varela-Santos, E., Ochoa-Martinez, A., Tabilo-Munizaga, G., Reyes, J. E., Pérez-Won, M., Briones-Labarca, V. and Morales-Castro, J. 2012. Effect of high hydrostatic pressure processing on physicochemical properties, bioactive compounds and shelf-life of pomegranate juice. *Innovative Food Sci. Emerging Technol.* 13:13-22.

Vargas-Ramella., Márcio., Pateiro, M., Gavahian, M., Franco, D., Zhang, W., Mousavi, A., Khaneghah., Guerrero-Sánchez, Y. and Lorenzo. J.M. 2021.Impact of pulsed light processing technology on phenolic compounds of fruits and vegetables. *Trends in Food Sci. Technol*. 11: 1-11.

Velasco-Hernández, A., Saucedo-Veloz, C., Ramírez-Guzmán, M.E., Chávez-Franco, S.H., Valle-Guadarrama, S. and Saucedo-Reyes, D. 2020. Effect of moderate thermal treatments on the inactivation of a strain of *Listeria monocytogenes* and physicochemical properties of soursop pulp. *Food Sci. Technol. Int.*26(6): 535-548.

Verma, S. and Singh, J. 2021. Comparative analysis of preservation techniques on the physicochemical properties of papaya pulp. *J. Food Processing and Preservation.* 45(11):15784. https://doi.org/10.1111/jfpp.15784.

Vidigal, I.G., Melo, M.P., Da Rós, P.C.M., Carvalho, A.K.F., Alencar, S.M. and Ferreira, A.L.G. 2023. Rheological and Physical Properties Affected by the Thermal Processing of Fruit: A Bibliometric Analysis. *Processes*. 11(10): 2874.

Vieira, F.N., Lourenço, S., Fidalgo, L.G., Santos, S.A., Silvestre, A.J., Jerónimo, E. and Saraiva, J.A. 2018. Long-term effect on bioactive components and antioxidant activity of thermal and high-pressure pasteurization of orange juice. *Molecules*. 23(10): 2706.

Villacís-Chiriboga, J., Elst, K., Van Camp, J., Vera, E. and Ruales, J. V. 2020. Valorization of byproducts from tropical fruits: Extraction methodologies, applications, environmental, and economic assessment: A review (Part 1: General overview of the byproducts, traditional biorefinery practices, and possible applications). *Compr. Rev. Food Sc.i Food Saf*. 19(2): 405-447.

Vollmer, K., Chakraborty, S., Bhalerao, P.P., Carle, R., Frank, J. and Steingass, C.B. 2020. Effect of pulsed light treatment on natural microbiota, enzyme activity, and phytochemical composition of pineapple (*Ananas comosus [L.] Merr.)* juice. *Food and Bioprocess Technol.*13:1095-1109.

Waghmare, R., Memon, N., Gat Y., Gandhi, S., Kumar, V. and Panghal, A. 2019. Jackfruit seed: An accompaniment to functional foods. *Brazilian J. Food Technol*. 22:1-9. Doi:10.1590/1981-6723.20718 .

Wang, D., Yeats, T. H., Uluisik, S., Rose, J. K. C. and Seymour, G. B. 2018. Fruit softening: Revisiting the role of pectin. *Trends in Plant Sci*. 23(4):302-310. https://doi.org/10.1016/j.tplants.2018.01.006

Wang, L., Deng, W., Wang, P., Huang, W., Zheng, T. and Cai, J. 2019. Comparative analyses of three sterilization processes on volatile compounds in sugarcane juice. *Transactions of the ASABE*. 62(6):1689–1696.

Wang, X. and Zhang, Y. 2016. Physico-chemical changes in apple pulp subjected to HPP. *Food Biophysics*. 11(2): 23-130.

Wu, W., Xiao, G., Yu, Y., Xu, Y., Wu, J., Peng, J. and Li, L. 2021. Effects of high pressure and thermal processing on quality properties and volatile compounds of pineapple fruit juice. *Food Control*. 130: 108293.

Xu, S., He, W., Yan, J., Zhang, R., Wang, P., Tian, H. and Zhan, P. 2023. Volatomics-assisted characterization of aroma and off-flavour contributors in fresh and thermally treated kiwifruit juice. *Food Res. Int.* 167:112656.

Xu, W., Chen, H. and Wu, C. 2013. Decontamination of Escherichia coli O157:H7 on green onions using pulsed light (PL) and PL-surfactant-sanitizer combinations. *Int. J. Food Microbiology.* 166:102–108.

Xu, Z., Wang, Y., Ren, P., Ni, Y. and Liao, X. 2016. Quality of banana puree during storage: a comparison of high pressure processing and thermal pasteurization methods. *Food and Bioprocess Technol.* 9:407-420.

Yadav, T.V., Choudhary, M., Garhwal, Om Prakash., Mahala., Prakash and Singh, S. 2015. Influence on levels of β-carotene, ascorbic acid and other physiological chemical qualities from acidification of carrot juice by blending. *The Bioscan*. 10(2): 699-703.

Yi, J., Kebede, B.T., Dang, D.N.H., Buvé, C., Grauwet, T., Van Loey, A., Hu, X. and Hendrickx, M. 2017. Quality change during high pressure processing and thermal processing of cloudy apple juice. *Food Sci. Technol*. 75: 85–92.

Yıkmış, S., Demirok, N.T., Levent, O. and Apaydın, D. 2023. Impact of thermal pasteurization and thermosonication treatments on black grape juice (*Vitis vinifera L*):ICP-OES, GC–MS/MS and HPLC analyses. *Heliyon*. 9(9).

You, Y., Li, N.A., Han, X., Guo, J., Zhao, Y.U., Liu, G., Huang, W. and Zhan, J. 2018. Influence of different sterilization treatments on the colour and anthocyanin contents of mulberry juice during refrigerated storage. *Innovative Food Sci. Emerging Technol.* 48: 1-10.

Yuan, L., Cheng, F., Yi, J., Cai, S., Liao, X., Lao, F. and Zhou, L. 2022. Effect of high-pressure processing and thermal treatments on colour and in vitro bioaccessibility of anthocyanin and antioxidants in cloudy pomegranate juice. *Food Chem.* 373:131397.

Zhang, J., Jinxiao, J., Cheng., Li, Z., Weng, M., Zhang, X., Tang, X. and Pan, Y. 2024. Effects of ultra-high pressure, thermal pasteurization, and ultra-high temperature sterilization on color and nutritional components of freshly-squeezed lettuce juice. *Food Chem.* 435:137524.

Zhang, L., Wang, Z., Shi, G., Zhao, L., Jiang, P. and Wang, X. 2022. Effects of different thermal processing methods on nutrients and flavor of Toona sinensis. *J. Food Processing and Preservation*. 46(7): e16691.

Zhang, S., Zheng, C., Zeng, Y., Zheng, Z., Yao, X., Zhao, Y. and Jiang, Z. 2021. Mechanism of colour change of carambola puree by high pressure processing and its effect on flavour and physicochemical properties. *Int. J. Food Sci. Technol.* 56(11):5853-5860.

Zhang, Y., Chen, L. and Wang, X. 2019. Comparative study of cost-effectiveness of thermal and non-thermal preservation methods for fruit pulp. *J. Food Sci*. 84(11):3123-3130.

Zhao, S., Pan, Z., Azarakhsh, N., Ramaswamy, H. S., Duan, H. and Wang, C. 2024. Effects of high-pressure processing on the physicochemical and adsorption properties, structural characteristics, and dietary fiber content of kelp (*Laminaria japonica*). *Current Res. Food Sci*. 8: 100671.

Zhou, Linyan., Guan, Y., Bi, J., Liu, X., Yi, J., Chen, Q., Wu, X. and Zhou, M. 2017. Change of the rheological properties of mango juice by high pressure homogenization. *LWT-Food Sc.i Technol.* 82: 121-130.

Zhu, S., Li, B. and Chen, G. 2022. Improving prediction of temperature profiles of packaged food during retort processing. *J. Food Eng.* 313:110758.

Zia, H., Slatnar, A., Košmerl, T. and Korošec, M. 2024. A review study on the effects of thermal and non-thermal processing techniques on the sensory properties of fruit juices and beverages. *Frontiers Food Sci. Technol.* 4: 1405384.

Zou, H., Lin, T., Bi, X., Zhao, L., Wang, Y. and Liao, X. 2016. Comparison of high hydrostatic pressure, high-pressure carbon dioxide and high-temperature short-time processing on quality of mulberry juice. Food *Bioprocess Technol. 9*:217-231.