

Thanchanok Udomsup 2011: Product Development of Carbonated Mangosteen Juice. Master of Science (Agro-Industrial Product Development), Major Field: Agro-Industrial Product Development, Department of Product Development. Thesis Advisor: Assistant Professor Nantawan Therdthai, Ph.D. 156 pages.

From product development, carbonated mangosteen juice was comprised of 62% pectinase treated puree (240 ppm pectinase for mangosteen juice with addition of stabilizer and 120 ppm pectinase for mangosteen juice with addition of fining agent), 35% hull solution (2.5%(w/v)) and 3% red grape juice. In development of carbonated mangosteen juice with addition of stabilizer, an increase in xanthan gum concentration significantly increased cloudiness and viscosity of the juice ($p \leq 0.05$). Therefore, to decrease the viscosity and stabilize cloudiness of the juice, a mixture of 0.10%(w/v) xanthan gum and 0.15%(w/v) carboxymethylcellulose should be used as a stabilizer. Then the juice was pasteurized at 85°C for 15 min. The obtained carbonated mangosteen juice had viscosity of 9.37 ± 0.47 cP, L* value of 56.1 ± 2.64 , a* value of 17.94 ± 1.20 , b* value of 53.19 ± 1.50 , pH of 3.51 ± 0.01 , total soluble solid of 11.8 ± 0.1 °brix and polyphenol content of 124.24 mg GAE/L. For development of carbonated mangosteen juice with addition of fining agent, fining agent, incubation time and pH significantly affected L* value and %transmittance ($p \leq 0.05$). To obtain the highest L* and %transmittance, fining agent (0.05:0.15%(w/v) gelatin:bentonite ratio) should be used at pH 3.5 before centrifugation. The clear part was taken for pasteurization at 85°C for 15 min. The obtained carbonated mangosteen juice had L* value of 67.47 ± 2.86 , a* value of 17.36 ± 1.51 , b* value of 54.62 ± 1.75 , pH of 3.50 ± 0.02 , total soluble solid of 11.2 ± 0.1 °brix, polyphenol content of 118.47 mg GAE/L and tannin content of 86.59 mg TAE/L. Microbiological quality of the carbonated mangosteen juice met the standard (publication of ministry of health, circulars no. 290, 2005). Overall liking scores were in range of slightly like to moderately like with acceptance of 77.3% and 89.3% for carbonated mangosteen juice with addition of stabilizer and fining agent, respectively. During storage at 4, 25 and 35°C, L* value, polyphenol content and tannin content of carbonated mangosteen juices were significantly decreased, whereas a* and b* values were significantly increased ($p \leq 0.05$). Overall liking scores of both mangosteen juice were significantly decreased as storage time increased ($p \leq 0.05$), in exception at storage temperature 4°C. The change of these physical and chemical qualities, influenced by storage temperature, could be explained by Arrhenius equation. According to this study, both carbonated mangosteen juices could be stored at 4°C for at least 8 weeks and at 25 and 35°C for at least 4 weeks. The products still provided microbiological safety to consume and earned more than 50% acceptance. In addition, no sedimentation was observed during storage.

Student's signature

Thesis Advisor's signature