

Varaporn Vittayaporn 2012: Process Development of Green Tea with Roasted Brown Rice for Household Production. Doctor of Philosophy (Agro-Industrial Product Development), Major Field: Agro-Industrial Product Development, Department of Product Development. Thesis Advisor: Associate Professor Penkwan Chompreeda, Ph.D. 270 pages.

The aim of this research was to develop green tea combined with roasted brown rice by using raw materials in Thailand and instruments for household production. Imported commercial green tea with roasted rice samples from market survey consisted of 3 brands of dried leaf tea and 4 brands of tea bags. Results from acceptability test of 7 samples of commercial green tea with roasted rice, consumer preferred tea bags than dried leaf tea. For sensory descriptive analysis, panel identified 18 sensory attributes. Results from preference mapping identified attributes into 2 PCs which PC1 was aroma and flavor of green tea that could describe 66.80% of the variation and PC2 was taste and aftertaste of tea that explained 17.10% of the variation. Results from electronic nose analysis of commercial green tea with roasted rice found response sensitivities of tea bags were higher than dried leaf tea. There were high correlations between electronic nose data and sensory descriptive data including seaweed flavor, tea flavor, green aroma, green flavor, dry flavor and seaweed aroma. Development of green tea with roasted brown rice was composed of studying on processes of green tea and roasted rice. Optimum process of green tea including selecting fresh tea leaves only 3 young leaves (200 g), steaming 1 min, first moisture removing with roaster at 80°C (20 min), rolling 10 min, second moisture removing with roaster at 80°C (10 min) and tray drying at 80°C (30 min), grinding and screening for 30 mesh. Optimum process of Hom-mali brown rice was composed of cooking brown rice (500 g) for 12 min, tray drying at 70°C for 100 min and roasting at 200°C for 5 min. From product formulation, optimum ratio of green tea : roasted Hom-mali brown rice = 1.0:1.1. The qualities of green tea with roasted Hom-mali brown rice were 2.33% moisture content, Total ash 3.08 g/100g, water soluble ash 46.58% (of total ash), hot water extract 31.16 g/100g, caffeine 17.44 mg/g, EGCG 46.43 mg/g, 6.23% total polyphenols. Color with L*,a*,b* values and transmittance of brewed tea were 89.93,-2.45, 21.55 and 74.22%, and it had almost clear greenish yellow color. For acceptability test by using 200 consumers, they liked product moderately. After providing benefit of EGCG of product, McNemar test showed that significantly ($p \leq 0.05$) increased product acceptance.

Student's signature

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