

## Development of a Veggie Burger as Beef Meat Analogue and its Quality Characters

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### Abstract

This research was conducted to develop a veggie burger as beef meat analogue using vegetable based ingredients without preservatives for health conscious consumers. Suitable vegetable mixture proportion was selected & blanched vegetables were selected for further experiments based on the colour persistence. Chickpea was selected for burger base out of Chickpea, Chickpea dhal, Mung bean, Lentil. Rice flour: wheat flour (RW), rice flour: isolated soya protein; ISP (RI), wheat flour: ISP (WI), Chickpea flour: ISP (CI) were used as binder mixtures (1:1) & based on the sensory results RW & RI selected as best binder mixtures. Further trials were performed to choose best formulation while testing prior selected 2 different binder mixtures with and without fat emulsion (5 & 0% w/w) which resulted in 4 treatments such as RW 5% (T<sub>1</sub>), RI 5% (T<sub>2</sub>), RW 0% (T<sub>3</sub>) & RI 0%(T<sub>4</sub>). The influence of emulsion (0 & 5%) and binder (RW & RI) on the biochemical properties (pH, proximate as TS, fat, ONF, moisture, ash), keeping qualities (microbial as *salmonella*, *Staphylococcus aureus*, *E coli*, PDAC, TPC and peroxide value), physical properties (WHC, purge loss, cooking loss) & sensory characters of veggie burger stored at -18<sup>o</sup>C for 90 days were tested. To investigate the effect of freezing & thawing, the set of sample was thawed daily for 2 hours then refreeze again and another sample was freeze with out thawing and analyzed for microbial & sensory properties. Sensorial characters were altered with emulsion addition especially in texture and juiciness & T<sub>1</sub> selected as best sample based on sensory score rating remained between good and very good during storage (p<0.05). Proximate analysis revealed that T<sub>1</sub> had gained 51.68% moisture, 8.38% fat, 48.33% TS, 36.84% ONF & 3.1% ash and also TPC (4.54 log CFU/g), pH (6.67) & peroxide value (9.62 meq/kg) with in standard even after 90 days of storage. Cooking loss components were not affected by binder or emulsion (p>0.05). T<sub>1</sub> had 1.75%±0.03 lowest purge and 45.98% ±0.01 highest WHC at days 90 (p<0.05) due to rice and wheat flour addition was improving the reduction of purge and WHC. Microbial counts were 4.11 and 4.20 log CFU/g in thawed & unthawed samples, respectively (p<0.05). But they were in acceptable level for TPC even after 45 days. At 30<sup>th</sup> day, thawed was unsatisfactory for PDAC (2.04 log CFU/g). Addition of RW with emulsion to burger could not only provide perception of nutrition but also produce a comparable product in term of textural and sensory characters.

**Keywords:** chickpea, ISP, quality characters, rice flour, veggie burger, wheat flour