

Improving the microbial quality of *mung* (*Vigna radiata*) bean sprouts and its' shelf life to produce a safe and ready to eat product

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In Sri Lanka, legumes including *mung* bean (*Vigna radiata*) has been consumed frequently as a good source of plant protein. As germination process enhances the biological value of these legumes, people turned towards the consumption of sprouts than consuming them as seeds. Due to the availability of the nutrients as well as the warm and humid conditions during the germination process, a rapid microbial growth has been identified. As a result, out-breaks associated with the consumption of sprouts in fresh form has frequently been reported. This may lead to consumption of sprouts become unsafe product for the consumers. Methods to extend the shelf life of sprouts, as well as the development of microbial safety of legume sprouts have been investigated during this study.

Mung (*Vigna radiata*) seeds were rinsed, soaked and germinated for 48 hours and a portion of the seeds were subjected to hot water blanching (at $100\pm 2^{\circ}\text{C}$ for 1 minute). Both blanched and non-blanched sprouts were packed immediately in low density poly ethylene bags and stored at different storage temperatures ($28\pm 2^{\circ}\text{C}$, $10\pm 1^{\circ}\text{C}$, $3\pm 1^{\circ}\text{C}$, $0\pm 0.5^{\circ}\text{C}$) with the objective of finding the best storage conditions to optimize the microbiological quality and shelf life. In the meantime, blanched *mung* bean sprouts were packed in sterilized glass bottles with 4% brine solution followed by pasteurization ($100\pm 2^{\circ}\text{C}$ for 30 minutes) and the microbial quality of the product was evaluated during the period of storage up to twelve months.

Hot water blanching has significantly ($p < 0.05$) reduced the mesophilic bacterial count from 7.35 Log_{10} (CFU/g) to 5.71 Log_{10} (CFU/g) when compared with non-blanched *mung* sprouts. The psychrophilic count of legume sprouts has significantly ($p < 0.05$) decreased from 4.18 Log_{10} (CFU /g) to 3.48 Log_{10} (CFU/g) by hot water blanching and with storage temperature of $0\pm 0.5^{\circ}\text{C}$ up to 15 days of storage when compared to non-blanched *mung* bean sprouts during the same storage period. Blanching and storage at $0\pm 0.5^{\circ}\text{C}$ of temperature significantly increased the microbiological quality with optimizing the product safety in fresh form and extending the shelf life for 15 days. Application of Blanching along with storage at $0\pm 0.5^{\circ}\text{C}$ of temperature is a method to reduce the risk of food borne infections involve in consumption of fresh form of legume sprouts.

Blanching followed by pasteurization of *mung* bean sprouts in brine has shown significant ($p < 0.05$) improvement of microbial quality as well as extended the shelf life up to one year without affecting the availability of protein. Possibility of extending shelf life further is being explored. Legume sprouts in brine is an ideal method of processing to introduce as a safe, ready to eat, rich source of plant protein product for the Sri Lankan consumers.

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