

## Process optimization for instant pigeonpea (*Cajanus cajan* L.) dal using $\text{NaHCO}_3$ (Sodium bi-carbonate) pretreatment

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### ABSTRACT

$\text{NaHCO}_3$  (sodium bicarbonate) was used in the soaking treatment for preparation of instant pigeonpea dal. The combination of three factors, salt concentration (0.5 – 1.0%), cooking time (8–12 minutes) and flaking thickness (0.5mm – 1.0 mm) were used for the product development. Four sensory parameters; colour, odour, taste and overall acceptability and two instantisation parameters namely reconstitution time and rehydration ratio were evaluated. A combination of salt concentration of 0.80%, cooking time of 10 minute and flaking thickness of 1.0 mm was found to be the optimum combination for the developed product.

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**Key words :** Reconstitution time, Rehydration ratio, Flaking, Pigeonpea, Instant dal

### INTRODUCTION

Pulses occupy an indispensable place in our daily diet as a source of protein. It serves as the cheapest source of proteins and rich in lysine for which the lysine deficient cereal diets are supplemented with that of pulses (Bongirwar and Srinivasan, 1971). Black gram, pigeonpea, green gram, pea etc. are the main legume crops grown in India. After chickpea, pigeonpea (*Cajanus cajan* L.) is the second largest legume crop grown in India. It is mainly consumed in dehusked split form, commonly called as dal or dhal. Dal takes a longer cooking time to come to the desirable gruel form which is an essential part of the Indian palate (Bhuibhar, 1991). People, especially in the urban areas, cannot devote their precious time and full attention to this lengthy cooking procedure. Hence, preparation of ready to eat “Instant Pigeonpea Dhal” is the need of the hour.

Some efforts have been made to develop the quick cooking pulses by understanding the influence of various processing parameters on the cooking time of the pulses. Dehusking and splitting of pulses is widely used to reduce the cooking time of pulses and being commercially exploited (Kon *et al.*, 1973; Desikachar and Subramanya, 1961 and Eduardo Beuno Carro *et al.*, 1980). Cooking time of the kidney beans reduced considerably by soaking the beans for the duration of 8 hours and pressure cooking at 13 psi for the duration of 20 minutes of freezing and dehydrating (Charles *et al.*, 1956). Coating of precooked

beans with that of sugar solution followed by the dehydration was used to reduce the cooking time by Steinkraus *et al.* (1964). The beans were ready for the consumption after boiling for 30 minutes and had smooth uniform texture. Bhuibar *et al.* (1991) studied on the instantization process of redgram dhal. They dried the redgram sample in a laboratory scale fluidized bed dryer at three different temperatures *i.e.* 60, 70 and 80°C. They found that, time of dehydration of the precooked dhal decreased as the drying temperature increased. The percentage reduction in the cooking time (35 minute), was 80 – 84 % when cooking in the boiling water as compared to 34 – 42 % and 57 – 64 % in normal water at 35°C and hot water at 70°C, respectively.

Patki and Arya (1994) prepared both spiced and unspiced bengal gram (*Cicer arietinum* L.), Black gram (*Phaseolus mungo* L.) and redgram (*Cajanus cajan* L.) dhal flakes by soaking the split dhal in sodium chloride and sodium carbonate solution. The raw material cooked under 15psi steam pressure, conditioned to 32% – 35 % moisture content, flaked to different thickness and then dried to a moisture content of 5 % at 100°C. The flaked dhals reconstituted within 3 minute when mixed with hot water (90-95°C). Singh and Rao (1995) experimented on the influence of salt solution as pretreatments on the preparation of quick cooking dhal. Salt solution (1% w/v) used individually were those of sodium chloride, sodium bicarbonate and sodium tripoly phosphate. The salt mix

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