

## Effect of grain moisture on popping quality of sorghum

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### ABSTRACT

Five sorghum genotypes viz., CSV-10, CSV-15, CSV-17, SPV-245 and Pratap Jowar-1430 were raised to 10-18% (db) grain moisture level and evaluated for popping percentage, popping volume and expansion volume by salt and sand roasting method of sorghum popping. For salt roasting method, of all the genotypes CSV-17 had the highest popping percentage (70.19%), popping volume (122.33 ml) and expansion volume (12.23 ml/g) at 12% grain moisture level and for sand roasting method, the genotypes CSV-17 had the highest popping percentage, popping volume and expansion volume *i.e.* 20.18%, 50ml and 5ml/g, respectively. The genotype CSV-10 has shown the highest grain weight, popped grain weight and diameter of grain *i.e.* 14.43g, 12.28g and 3.5mm, respectively while the genotype SPV-245 has shown highest diameter (7.5 mm) of popped grain, genotype CSV-17 has shown the highest grain volume (12.5 ml) and the genotype SPV-245 has shown the highest popped grain volume (165 ml). The genotypes SPV-245 and CSV-10 have shown the highest density of grain and density of popped grain *i.e.* 1.17 and 0.08 g/ml, respectively. In the quality evaluation of popped sorghum, the genotype SPV-245 gave the best for all quality attributes of products. Biscuits were evaluated for physical properties and sensory evaluation. The colour, texture and appearance were found to be best for composition 60% maida + 10% sorghum flour+20% soybean flour and the flavour, taste and overall acceptability were best for composition 60% maida + 30% sorghum flour + 10% soybean flour. All the organoleptic qualities were significantly affected at 5% level. The composition (60% maida + 10% sorghum flour + 30% soybean flour) was best for nutritional evaluation of biscuits.

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**J**owar (*Sorghum bicolor* (L) Moench) is the third most important cereal of India after rice and wheat Sorghum can be popped to produce delightful snacks. The popping quality of several varieties of sorghum has been studied by various workers (Murthy *et al.*, 1982; Savithri and Rao, 1985; Thorat *et al.*, 1988; Rooney and Murthy, 1981). Popped sorghum is less hull, does not clog in the space between teeth and causes less noise, when eaten as compared to popcorn. Also, its flavour and nutritive value compare well with popcorn (Subramanian, 1956). Popping of sorghum at about 17% grain moisture level and at a grain moisture content of 9-10% have been reported (Prasad Rao and Murthy, 1981). The present investigation has been undertaken to study the physical properties of developed products.

### METHODOLOGY

Five sorghum genotypes viz., CSV-10, CSV-15, CSV-17, SPV-245 and Pratap Jowar-1430 were obtained from the Department of Plant Breeding and Genetics, Rajasthan College of Agriculture, Udaipur. After estimation of their initial moisture content by oven drying method were tempered to a moisture level of 10%, 12%, 14%, 16% and 18% on d.b. The sample (10g) was placed in an iron pan, containing 100g of salt maintained at a

temperature of 160°C, covered with a lid and stirred briskly for 40 to 60 seconds The mixture containing popped grains and salt was passed immediately through 40 mesh sieve to remove salt from popped grains (Singh and Srivastava, 1993). The samples were analysed in triplicate for popping percentage, popping volume and expansion volume.

### Analysis of popped sorghum :

Sieving using horizontal oscillating motion separated the mixtures of unpopped and popped sorghum grain. The popped sorghum was retained on the screen while unpopped sorghum passed through the sieve. The popping percentage was calculated using equation (1) (Singh and Srivastava, 1993). The number of kernels used in popping and number of popped kernels were determined by counting manually.

$$\text{Popping percentage} = \frac{\text{Number of popped kernels}}{\text{Number of kernels used in popping}} \times 100 \dots (1)$$

The volume of popped sorghum was measured in a measuring cylinder. The expansion volume per unit mass of sorghum was calculated by using equation (2). The original weights of raw kernels were weighed using the top pan electronic balance.