

Research Paper :

Study of effect of packaging and storage on the quality of onion powder prepared by osmotic dehydration

G.B. YADAV, S.B. SONI AND B.P. SAWANT

Accepted : December, 2009

See end of the article for authors' affiliations

Correspondence to:

G.B. YADAV

Department of Soil and Water Conservation Engineering, College of Agricultural Engineering, Marathwada Agricultural University, PARBHANI (M.S.) INDIA

ABSTRACT

Onion powder prepared from 5 mm thick osmotic dried onion slices after drying in cabinet dryer at 60^o C up to moisture content 4 per cent, grinding in mixer and sieving with 30 mesh sieve, can be stored up to 2 months in 400 gauge LDPE, 200 gauge HDPE, and aluminum foil pouches. During storage at room temperature there was slight increase in physico-chemical composition of onion powder dried by osmotic dehydration. In case of packaging material aluminum foil pouches showed better result followed by 200 gauge HDPE pouches and 400 gauge LDPE pouches. The retention of pungency was maximum in N-53 (red) variety osmotic dried onion powder.

Key words : Onion, Storage, Package, Dedydration

There are several dehydration units in India, which produce dehydrated onion flakes for export as well as for domestic consumption. But during mechanical drying of white and red onion flakes, pink discoloration often adversely affects the quality of dried onion. Recently osmotic drying, which is the process of water removal, is used. During osmotic processing water flows from the product in to the osmotic solution, where osmotic solute is transferred from the product in to the product.

Like any other powder, onion powder prepared from osmotic dehydrated onion slices also undergo lots of physical and chemical changes if it is not properly packed and stored. These changes can be controlled after providing adequate packaging (Sagar, 2001). Most of onion dehydration unit are using white onion cultivars for processing. But the production of white onion, in India is less as compared to red onion cultivars. The N-53 variety of red onion cultivar is popular, most of farmers prefer to grow N-53 variety. After harvesting of onion in particular season, onions are available in huge quantity. The storage structure for storage of onion are inadequate and fresh onion can not be easily stored more than 3 months. Therefore, there is wastage of onion in large quantity.

METHODOLOGY

Medium to large size of onion bulbs of four cultivars were procured from different farmers field. After peeling, onion bulbs were cut into slices of 5 mm thickness. The drying was carried out by osmotic drying process. In osmotic drying the onion slices were placed in container holding 15 per cent common salt at ambient temperature.

The slices were stirred at regular interval up to 6 hr. After 6 hr the slices were removed quickly and drained. The drained slices were placed in aluminum trays. The drying was carried out in hot air tray dryer at 60^o C and it was continue until moisture content of slices become 4 per cent. Slices were powdered by grinding in mixer, followed by sieving with 30-mesh sieve. Onion powder was packed in 400 gauge LDPE, 200 gauge HDPE and aluminum foil pouches. The powder was stored at room temperature and product was analyzed up to two months with one month interval.

Five sample of onion bulbs from each cultivar were selected for measurement of physical characteristics such as average bulb weight, polar diameter, equatorial diameter, geometric diameter, skin colour, average bulb size (LxB), shape index. Moisture content of was determined by drying the sample to constant weight in hot air oven. Total soluble solids was measured by using Erma made hand refractometer (0-32^o Bx), ash content was measured by the method of Rangnna (1986). Pungency in terms of pyruvic acid was estimated by method given by Schwimmer and Weston (1962). Reducing and total sugar were determined by titrating the samples against Fehling's solution using methylene blue as an indicator (Lane and Eynon, 1923). Non enzymatic browning in onion powder was measured in terms of optical density at 440 nm of an aliquot of 60 per cent alcoholic extract (Rangnna 1986).

RESULTS AND DISCUSSION

The findings of the present study as well as relevant