SELECTION OF SUITABLE PACKING MATERIAL FOR HYGROSCOPIC FOOD PRODUCTS

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ABSTRACT

In modern age, food packaging has become very important because of protection of the product from contamination by macro and micro-organisms and their filth, prevention from loss or gain of moisture and to facilitate handling. In Sri Lanka, hygroscopic food products such as noodles and pasta products are dried to get moisture content below 10% and packed in bags made out of low density polyethylene, oriented polypropylene and double laminate packaging materials. These bags are exposed to varying relative humidity levels for several months during storage and transport permitting adsorption and desorption of moisture by noodles products. This may cause to market returns of the products as well. The effects of different packaging materials; Low Density Polyethylene (LDPE),Oriented Polypropylene, double laminate and triple laminate packaging materials on the shelf stability of hygroscopic food products (red rice noodles) under tropical ambient temperature and different relative humidity levels were evaluated for 3 months duration to select the suitable packaging material. Harischnadra red rice noodles (5 g) at 6.5 – 7.5 % moisture content was packed and sealed in of the low density polyethylene (5.5 cm × 6 cm) (250 μm), oriented Polypropylene (240 μm), double laminate (320 μm) and triple laminate (280 μm) pouches. Moisture transmission of the packed red rice noodles in different packaging materials was carried out by exposing them to four relative humidity levels (55% to 86%) at a temperature of 25^0C. The relative humidity environments were obtained by preparing four saturated salt solutions (representing environments of 55 %,70 %,76 %,86 % respectively. and the packed red rice noodles were placed in the humidity chambers that contained saturated salt solutions. The moisture adsorption of noodles, packed in four different packaging materials were estimated at weekly intervals for 75 days. This study has shown that TL and DL packaging materials performed well as moisture barriers. A major finding was that TL and DL packaging materials have the lowest water vapor transmission rates. It was also shown that, the cheapest packaging material was LDPE and the cost one was Triple Laminate packaging material. The evidence from this study suggests that using double laminate packaging material was the safe and economical packaging material for hygroscopic food products as Red Rice Noodles.

Key words: hygroscopic, adsorption, relative humidity, red rice noodles, packaging materials