Introduction

Rice (*Oryza sativa* L.) is one of the leading food crops in the world and the staple food for more than half the world’s population (Champagne, 2004). World rice production was estimated at 651.7 million tonnes in 2007, while Iran’s rice production was 3.5 million tonnes (FAO, 2007).

Knowledge of the physical properties of agricultural products and foods is important for designing the equipment for processing, transportation, sorting, separation and storing. Designing such equipment without taking these into consideration may yield poor results (Kashaninejad *et al.*, 2006). The major moisture-dependent physical properties of biological materials are shape, size, mass, bulk density, true density and porosity (Mohsenin, 1980).

Principle axial dimension of seeds are useful in selecting sieve separators and calculating grinding power during size reduction. Bulk density is used in the design of drying and aeration systems because it affects the resistance to airflow of a stored bulk. Bulk density, kernel density and porosity can be useful in sizing grain hoppers and storage facilities. They can also affect the rate of heat and mass transfer of moisture during aeration and drying process. Such information is useful in sizing motor requirements for seed transportation and handling. Therefore the determination and consideration of these properties plays an important role in the rice industry (Kashaninejad *et al.*, 2008; White and Jayas, 2001).

Aerodynamic properties such as the terminal velocity of agricultural products are important and required for the design of air conveying systems and the separation