Some Physical Properties of Sesame Seed of Muganli-57 Cultivar

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Abstract: Knowledge of the physical properties of sesame seed, which is grown widely in Turkey, is necessary for the design of equipment for harvesting, transporting, cleaning, packing, storing, processing etc. In this study, linear dimensions, mass, seed mass, volume, sphericity, surface area, true and bulk density porosity and terminal velocity of sesame seed of Muganlı-57 cultivar were determined, and the effects of four moisture contents such as 5%, 8%, 10 and 13% w.b. on the properties were investigated. At water content levels from 5% to 13% w.b., the linear dimensions increased from 3.75 to 3.41 mm in length, 1.89 to 1.99 mm in width, and 0.70 to 0.90 mm in thickness. The geometric mean diameter and sphericity increased from 1.66 to 1.88 mm and 48.68 to 50.82 %, respectively. The moisture contents considered the volume, surface area and mass of the sesame seed varied from 2.29 to 2.46 cm^3, 8.62 to 11.10 mm^2 and 0.064 to 0.078 g, respectively. Terminal velocity increased from 4.036 to 5.395 m/s at moisture content levels. The static coefficients of friction were measured at the different moisture contents on three different surfaces, and results varied between 0.211–0.230.
Keywords: Sesame, Physical Properties,

INTRODUCTION

Sesame (*Sesamum indicum* L.) is known as the most ancient oil seed according to some archaeological findings. Its cultivation goes back to 2130 B.C (Weis, 1983). The more than 90% crop breeding in the world has been produced from approximately 13 different oil plants. Sesame has been substituted in 8 th or 9 th order according to situation or yield of the plants in these oil plants. After the China and India which are the biggest procedures in the world, Myanmar, Sudan, Mexico, Nigeria, Venezuela, Turkey, Uganda and Ethiopia have been came, respectively. (Oplinger et al., 1990).

According to 2005's data, 43 000 ha sowing area, 3 000 tone production and 535 kg/ha yield of the sesame were recorded in Turkey. When the average yield values of the Turkey were compared with the average yield values of the world, it was a few lower. Sesame oil has high quality among the vegetable oils. It is durable to including sesamol and different nutrition. Sesame oil is canary and nice smells. The pulp is a reminder to refine of the oil.

The physical properties of sesame seed are important for design of equipments for processing, transportation, sorting, separating and also packing. Since currently used systems have been designed without taking these criteria into consideration, the resulting designs lead to inadequate applications. This results in a reduction in work efficiency, an increase in product loss. Therefore, determination and consideration of these criteria have an important role in designing of these equipments.

Many studies reported on the physical properties such as orange (Topuz et al. , 2005), wheat (Yıldırım, 2001), hazelnut (Ozdemir and Akinci, 2004), chickpea (Konak et al., 2002), cotton seed (Ozarslan, 2002).

MATERIAL and METHOD

Seed of sesame were obtained from the cultivar - Muganlı-57 grown in 2006 following regular practices and harvested manually in the experimental field of Mutation Research Group, Agriculture Faculty at Akdeniz University, Antalya, Turkey. The moisture content of the sesame seed was determined by the oven-drying method (Asae, 1982).