



DESIGN AND FABRICATION OF LOW COST PEANUT COATING MACHINE

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Abstract

Coated peanut snacks exist in many super markets in Nigeria. However, machines used in their production are limited in existence. Where the machine exist, the costs of acquisition are exorbitant and beyond the reach of household and small scale peanut producers which still coat peanut with flour and egg manually. Therefore a low cost machine for coating peanut was designed and fabricated using locally available materials to improve small – large production output. The machine components which consists of a rotating drum, frame, shaft, speed regulator, the electric motor and the driving and driven pulleys was tested for coating 2.0kg of peanut with 2.7kg of wheat flour wheat flour and 0.51kg of egg suspension. The comparison between manual method and mechanical method shows that the production increase. The machine coating efficiency of 98.7% and effective coating capacity of 118.4kg/hr were obtained. The estimated cost of production of the machine was ₦110,410.00 (\$184).

Keywords: peanuts, coating, performance, cost.

1.0 Introduction

Peanut is a legume crop that belongs to the family of Fabaceae, genus *Arachis*, and botanically named as *Arachishypogaea*. They are believed to have originated in Central American region from where they spread to other parts of the world (Settaluriet al., 2012).

Peanuts are consumed all over the world in a wide variety of forms (Guimon and Guimon, 2012). Almost every part of groundnut is of commercial value. Apart from oil, they are widely used for production of peanut butter, confectionaries, roasted peanuts, and snack products, extenders in meat product formulation, soups and desserts and it has notably been the source of elimination of malnutrition amongst the population in many African countries in the recent years (Guimon and Guimon 2012).

Snacks are prepared mainly by frying and coating of the peanut kernel (Varela and Fiszman, 2011). It can also be obtained by roasting or cooking of ground nut. Snack peanuts can be consumed wherever food is allowed. According to Senhui *et al.*, (2005) snack peanuts are most frequently consumed at home. Snacks are often eaten at working site. They are also consumed in many other places or events, including bars, cars, sporting events, parties, and restaurants (Senhuiet al., 2005). Snack peanuts are favorites for mid-afternoon snacks and after-dinner snacks (Senhui *et al.*, 2005).

Coatings are especially important in the snack food industry where the base often have an unattractive appearance and tastes bland, mealy, sticky, dusty or dry. The secret to the popularity of these snacks is coatings, which give an appealing colour and flavour (Barringer 2002). Coating of peanut can be done manually or mechanically.

Many machines have been design for coating seeds or /and nuts. Bao *et al* (2003) developed a seed coating machine by using a controlled volume pump providing seed coating as well as an outer-grooved sheave supplying constantly seed to the machine to achieve the ratio of weights of seeds and seed coating precisely and