EFFECT OF STORAGE CONDITIONS ON THE FLOWABILITY OF
DIFFERENT MILK POWDERS FOR HOPPER DESIGN

NUR AJEERA BINTI ISA

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Faculty of Chemical Engineering
Universiti Teknologi Malaysia

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Makanan dihasilkan dalam bentuk serbuk untuk memanjangkan jangka hayat dengan mengurangkan kandungan air. Serbuk kelihatan mudah untuk dikendalikan, bagaimanapun, terdapat banyak isu-isu penting dalam menyampaikan serbuk yang terdiri daripada pelbagai operasi seperti semasa penyimpanan, pengendalian, pengangkutan dan pembungkusan. Keupayaan mengalir serbuk makanan merupakan satu isu penting dalam mengendalikan serbuk dalam operasi-operasi terutamanya semasa penyimpanan di mana serbuk disimpan di dalam silo atau corong. Dengan menggunakan kaedah reka bentuk corong Jenike, bersama-sama dengan sifat-sifat fizik yang diukur seperti kepadatan pukal dan sifat aliran serbuk, nilai $\alpha$ dan $D$ corong dikira. Jenis serbuk mempunyai pelbagai jenis ciri-ciri fizikal dan aliran. Dalam kajian ini, tiga jenis susu tepung, Tepung Susu (SMP), Susu Tepung Seluruh (WMP) dan 65% Tepung Penuh Lemak (FFP) dengan kandungan lemak yang berbeza dikira nilai $\alpha$ dan $D$ dalam keadaan penyimpanan yang berbeza. Kesaran daripada keadaan penyimpanan pada keupayaan mengalir serbuk adalah disiasat melalui reka bentuk corong.
Food is produced in powdered form to prolong its shelf life by reducing the water content. Powder looks easily to handle, however, there are many important issues in delivering powder which consist of a variety of operations such as during storage, handling, transportation and packaging. Flowability of food powder is an important issue in handling powders to the operations especially during storage where the powder is stored in the silo or hopper. By using Jenike’s hopper design methodology, along with the physical properties measured such as bulk density and flow properties of the powder, the $\alpha$ and D values of a hopper are calculated. Different types of powder have different types of physical and flow properties. In this study, three different types of milk powder; Skim Milk Powder (SMP), Whole Milk Powder (WMP) and 65% Fat Filled Powder (FFP) with different fat contents had $\alpha$ and D values calculated in different storage conditions. The effect of storage conditions on the flowability of the powder are investigate through the hopper design.
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