

Devising optimal technological parameters for spray drying to produce whole camel milk powder

ABSTRACT

Camel milk is a valuable source of protein and nutrients, it has therapeutic and prophylactic properties. The production of dry dairy products based on camel milk implies prolonging its shelf life, a decrease in the cost of its transportation and storage. To manufacture dry camel milk, it is necessary to optimize the technological parameters of drying, which affect its physical-chemical properties. Whole milk from camels (*Camelus dromedarius*) was dried on a spray drying plant under the following modes: the inlet temperature from 140 °C to 160 °C; the feed rate from 30 ml/min to 40 ml/min. The dependence of such physical properties of milk powder as the water solubility index, water absorption index, moisture content, hygroscopicity, density, water activity, the stickiness and size of particles on the technological parameters of drying has been established. The study results show that the highest index of solubility of samples was equal to 81.25 ± 0.11 %, which corresponded to the air temperature at the inlet of 150 °C and the feed rate of 30 ml/min. At the same time, the lowest solubility was 62.89 ± 0.27 % under the modes of 140 and 40 ml/min, respectively. With an increase in the air temperature at the inlet and a decrease in the rate of supply of dairy raw materials, there was a decrease in the moisture content and water activity. However, an increase in the air temperature at the inlet above 150 °C led to a decrease in the solubility index in water. The optimal particle sizes of whole camel milk powder, preceding a relatively high solubility index, were 36.22 ± 0.33 μm , 108.89 ± 0.56 μm , and 229.19 ± 0.74 μm . The data reported in this paper could be useful in devising the technology for manufacturing a dry milk product from camel milk

Keyword: Dry whole camel milk; Spray drying; Physical properties; Production technology