

In vivo study on the slow release of glucose in vacuum fried matrices

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Abstract

In vitro studies have shown that vacuum frying may be an effective process to reduce starch digestibility as it may limit gelatinization; this is significant as overconsumption of starchy foods contributes to obesity and type 2 diabetes. Although in vitro studies are an instrumental tool, in vivo studies allow observation of the overall effect on a living organism. The aim of this research was to assess how in vivo starch digestibility can be reduced when frying under vacuum (9.9 kPa), after feeding Sprague-Dawley rats, while also understanding its relationship to in vitro starch digestibility. Results showed that vacuum-fried dough has a lower degree of gelatinization (~53.8%) and a maximal blood glucose level at 60 min (slower glycemic response) than atmospheric counterparts (~98.3% degree of gelatinization and maximal blood glucose level at 30 min). Similarly, in vitro procedures exhibited less rapidly available glucose and higher unavailable glucose fractions in vacuum-fried dough.

Keywords

Vacuum frying, Frying, Gelatinization, Glycemic response, Starch digestibility, Unavailable glucosa, Slow digestion, In vivo study.