Chemical, Physical and Sensory Characteristics of Lactose-reduced Baked Custards Made with a Low-fat, Low-cholesterol Egg Substitute

by

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(ABSTRACT)

Two experiments were conducted to examine the effects of type of milk (whole; nonfat; nonfat, 70% lactose-reduced) and type of egg (fresh, whole egg; egg substitute) on the quality of baked custards. The egg substitute was a combination of dried egg white solids, dried low-fat, low-cholesterol egg yolk solids, and xanthan gum. Custard formulations served as prototypes for use in studies conducted in the Department of Food Science and Technology, Virginia Tech. In those studies, the effects of processing parameters on the quality of the custards were examined. The goal of all the studies was to develop shelf-stable lactose-reduced custard mixes that have potential for use in the foodservice industry.

In Experiment I, chemical, physical, and sensory characteristics of a dessert type baked custard, made with sucrose, were examined. In Experiment II, the same characteristics were examined for a cheese flavored, entree type custard made without sucrose. Results indicate that use of nonfat and nonfat, 70% lactose-reduced milk in place of whole milk decreased significantly total fat and cholesterol concentrations in both types of custard mixes. Lactose-reduced milk also decreased lactose and increased galactose concentrations. The egg substitute decreased total fat and cholesterol concentrations and increased protein concentration. In general, lactose reduction had little effect on the physical and sensory characteristics of both types of custards, but the egg substitute affected these characteristics. Custards made with the egg substitute had less intense yellow color and greater gel strength than those made with fresh, whole egg. These custards also were less bright and more uneven in color and had weaker egg flavor and aftertaste.

Based on results of this study, development of a lactose-reduced custard is feasible. However, additional studies are needed to examine potential for use of the formulations in the foodservice industry. Because the mixes could be used as bases for other types of products, such as custard pies, filled pastries, and quiches, studies that focus on development of those products could help define the niche for the mixes in the foodservice industry. Because of the trend in today's market for reduced-fat, reduced-cholesterol foods, additional studies could be done to examine the effects of various types of egg substitutes on the quality of the custards.