An informal survey of small, local retailers and manufacturers of chocolate confection products revealed a need for improved sugarfree products and a wider variety of ingredients available for use as sugar replacers. Several manufacturers and retailers stated that the sugarfree products they carried or manufactured used crystalline maltitol or maltitol syrup to replace the sucrose. Those who did not currently offer sugarfree chocolate products expressed an intent or interest in offering sugarfree options in the future. In addition, a local supplier of coatings to large confectionery product manufacturers indicated increased requests from customers for sugarfree confectionery coatings.

There are numerous possibilities for sucrose replacement in the manufacture of sugarfree chocolate coatings; however, there is little understanding of how or why different sweeteners might affect processing conditions and quality of the product. Polyols differ in hygroscopicity, solubility, sweetness, molecular size and heat stability. In addition, the purity of the polyol powder, which may vary according to specific manufacturing practices, may have an effect on product performance.

Applications of polyols in chocolate coatings may be limited by chemical and physical functionality (Figure 1). Thermodynamic properties of polyols and bulking agents could impact processing conditions due to differences in heat stability, viscosity effects or energy requirements for conching and tempering. Physical properties such as particle size, fracturability and physical state could affect rheology, conching temperatures and mouth feel. Sensory characteristics of the coatings may be affected due to differences in sweetness index, off-flavors, cooling effect and melt rate.

This study surveyed several polyols, chosen for their potential to create new choices in the market for sugarfree chocolate confections. The effects of polyol/bulking agent combinations on processing conditions, physical properties and quality parameters of the coatings were analyzed.

INGREDIENTS AND FORMULATIONS
The ingredients for use in the production of the sugarfree coatings included polyols (two maltitol powders from different manufacturers, isomalt, lactitol and erythritol), and bulking agents (polydextrose and inulin). A base formula for dark chocolate (Figure 2) was used. Previous work (Rapaille et al., 1994, 1995) provided guidelines for proportions of polyol/bulking agent for incorporation into the base formula. The polyols used in the study varied widely in sweetness relative to sucrose, and the polyol/bulking agent proportions may be optimized for product performance.