

## Chapter 1 Introduction

### 1.1 Principles, theory, and rationale

The candy market is expanded rapidly, especially in the diet candy which the sales was more than quadrupled between 2000 and 2004, fueled by better-tasting products, improved formulations and heightened concern over weight gain in adults and children. It was reported that between 2000 to 2004 the diet candy had 34 percent compound annual growth rate (CAGR). By comparison, chocolate had a CAGR of 3.9 percent, while non-chocolate candy actually suffered from a negative 2.5 percent CAGR (Anonymous, 2006a).

The consumption of confectionery in Thailand is lower compared to Europe and America. However, the market trend could be enhanced since the raw materials are domestic. The main product of confectionery in Thailand is high boiled sweet or hard candy which is more than 80% whereas the market of soft candy is limiting (Chaiseri *et al.*, 2543). The major materials of soft candy are sucrose and glucose syrup so too much consumption of candy can cause dental caries and weight gain.

Candies are prepared by dissolving sugar in water or milk to form a syrup, and boiling it until it starts to caramelize. Depending on the solvent and the end result of the process, the product may be called candy, caramel, toffee, fudge, praline, tablet or taffy. The recipe used also affects how hard, soft, chewy or brittle the end result will be (Anonymous, 2006b).

A sugar alcohol (also known as a polyol, polyhydric alcohol or polyalcohol) is a hydrogenated form of carbohydrate, whose carbonyl group (aldehyde or ketone, reducing sugar) has been reduced to a primary or secondary hydroxyl group. They are commonly used for replacing sucrose in foodstuffs, often in combination with high intensity artificial sweeteners to counter the low sweetness (Anonymous, 2006c).

Sugar alcohols are not acted upon bacteria in the mouth, and therefore they do not cause tooth decay. One of the sugar alcohols, xylitol, has been found to inhibit oral bacteria, and is often used in sugarless mints and chewing gums for this reason. The Food and Drug Administration of USA allowed the use of a health claim in food labeling that sugar alcohols do not promote tooth decay.

Sugar alcohols can reduce calorie and can be used as low carbohydrate diets because of their lower energy density (calories per gram). Therefore, the replacement of other carbohydrates with sugar alcohols can reduce the energy density of food products and could play a useful role in weight management. Polyols also may have a role in reducing the overall glycemic challenge of the diet (Anonymous, 2007a).

Sucrose (common name: table sugar, also called saccharose) is disaccharide (glucose and fructose) with the molecular formula  $C_{12}H_{22}O_{11}$ . Its systematic name is  $\alpha$ -D-glucopyranosyl-(1 $\rightarrow$ 2)- $\beta$ -D-fructofuranose. It is best known for its role in human nutrition and is formed by plants but not by higher organisms (Anonymous, 2007b).

Yogurt is probably the most popular fermented milk. It is made in a variety of composition (fat and dry matter content), either plain or with added substances: fruits, sugar or gelling agents. The essential flora of yogurt consist of thermophilic lactic acid bacteria, mainly *Streptococcus thermophilus* and *Lactobacillus delbueckii* ssp.

*bulgaricus*. For a satisfactory flavor to develop, approximately equal numbers of species should be present (Walstra *et al.*, 1999).

This research developed soft yogurt candy by studying different formula compositions to find a good quality of the final product. Yogurt was incorporated as a basic raw material in order to continue providing customers with milk nutrients, especially for the young generation. The application of honey to utilize another source and sugar alcohols to reduce the problems of tooth decay and calorie intake were also investigated.

### **1.2 Purposes of the study**

- i) to study different soft yogurt candy formula on the quality of the final soft yogurt candy product
- ii) to evaluate the effect of honey and sugar alcohols on the quality of soft yogurt candy
- iii) to investigate the quality changes of soft yogurt candy during storage at different temperatures

### **1.3 Application advantages**

1. A production technology of soft yogurt candy that could reduce dental caries and had a reduce calorie value
2. Increasing the diversification of milk products and sugar alcohols in confectionery products
3. Supporting the Thai dairy farmers by increasing the demand of raw milk and providing the farmers with a simple technology production of soft yogurt candy

### **1.4 Scope of study**

The scope of the study was to develop a good formula to produce soft yogurt candy. In addition, the effects of honey and sugar alcohols on the quality of soft yogurt candy were evaluated. At the end of the study, the shelf life of the yogurt candy was assessed.