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# Milk—the Essential Ingredient in Caramel

The major use of milk and milk products in confectionery manufacturing is in chocolate and caramel. A range of papers have been presented on a variety of dried and liquid dairy ingredients, chocolate crumb, specialty milks, modified dairy ingredients and milk derived flavors for incorporation into confections. This group of papers on milk and confectionery manufacturing will conclude with a brief discussion of caramel with milk as the essential ingredient. However, milk



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products are not only used in chocolate and caramel but in a wide variety of other products like fudges, toffees, hard candy, enrobed cremes, truffles, nougats and many more items.

Milk is an essential ingredient in caramel, but what is caramel? Caramel is a cooked solution or reaction product of milk, fat, corn syrup, and sugars plus other added components. The relative ratios of these ingredients determines the texture or consistency of the finished product. This consistency can vary from a soft flowable caramel to chewy, firm or grained product. The caramel texture or consistency is related to the relative proportions or ratios of sugar to corn syrup, the quantity and type of fat, the quantity and type of milk and how these components are handled. The finished caramel texture is determined not only by the ingredients used but by the cooking and cooling process. There are two basic types of caramel. A stand-up or slab-type caramel is firm enough after wrapping to hold its shape as an individual piece. The second type is a cast or soft, flowable caramel which is deposited in starch, molded or

extruded. This caramel is used as a component in combination with other ingredients such as chocolate, nuts, etc. to maintain the desired shape.

Caramel flavor is a combination of the flavors developed during cooking plus any added flavors. The Maillard reaction and the caramelization reaction create both flavor and color in the finished product. These process reactions along with any added flavorings creates the final flavor. The caramel flavor is related to the cooking process as well as to the ingredients used in the caramel formula. Therefore, caramel products available in the marketplace today are as varied as the number of companies making caramel products. A change in the caramel manufacturing process such as different equipment, water, or steam pressure, can change the flavor and texture of the final product even though the same formula and cook temperature is used.

Caramel contains four basic ingredients in significant amounts. This is different from most confectionery products. Caramel contains proteins from the milk, fat from milk or added vegetable oils, and carbohydrates from the milk in the form of lactose and from added carbohydrates such as sugar, corn syrup, invert syrup, dextrose, etc. The last ingredient is water which controls the overall texture, flavor and processing characteristics.

The protein component of caramel comes from the milk proteins in most cases. However, milk proteins can be introduced into a caramel formulation in a variety of ways. Is it a liquid or a dried milk product? Has the fat been removed from the milk or is the fat in the formula from the milk? Is the milk component a sweetened condensed

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