

Confectionery



Categories of confectionery



CHOCOLATE-BASED CONFECTIONERY

- min. 5% of cocoa components
 - ❖ Chocolate and Chocolate Confectionery

SUGAR-BASED CONFECTIONERY

- max. 5% of cocoa components
 - ❖ Non-Crystalline (Amorphous) Confectionery
 - ❖ Crystalline Confectionery





Sugar-based confectionery



Categories of sugar-based confectionery:

Crystalline confectionery	Non-Crystalline (Amorphous) confectionery
Fondant	Hard candies (Rock candies)
Caramel Fudge	Caramel Toffee
Compressed tablets	Jellies and Gummies

- Other candies:
 - ❖ nougat, marshmallows, marzipan, panned and licorice confections
- max. 5% of cocoa components





Sugar-based confectionery



The basic production process of sugar-based candies:

Non-Crystalline Candies

HARD CANDIES

mixing

(sucrose + water + glucose syrup)

dissolving

cooking (evaporating)

coloring and flavoring

forming

(cutting)

cooling

packing

Crystalline Candies

FONDANT

mixing

(sucrose + water + glucose syrup)

dissolving

cooking (evaporating)

cooling and crystallization

(cooling and whipping,
sucrose starts crystallizing)

forming





Sugar-based confectionery



Physical and chemical properties:

- ❑ **Boiling point elevation (final boiling point)**
 - affects water content and color in confectionery (Maillard reaction, caramelization)
- ❑ **The ratio of sucrose to glucose syrup**
 - = weight ratio of glucose syrup and sugar
 - affects the appearance and consistency of confectionery





Sugar-based confectionery

Physical and chemical properties:

□ Sugar crystallization

- important for forming of texture

Crystallization is affected by:

- ❖ temperature
 - ❖ agitation
 - ❖ viscosity
 - ❖ sweetener type
 - ❖ presence of other ingredients
-
- cooled without agitation – very large, coarse crystals (**hard candies**)
 - rapidly cooled with agitation – very fine crystals (**fondant**)



Sugar-based confectionery



BASIC INGREDIENTS OF CONFECTIONERY

- **Sweeteners** – sucrose, glucose, glucose syrup, fructose, invert sugar, sugar alcohols, etc.
- **Hydrocolloids** – starches, pectin, gelatin, gums
- **Proteins** – milk, eggs, soy protein
- **Fats** – butter, oil, margarine
- **Emulsifiers** – lecithin, glycerol monostearate
- **Flavouring and colouring agents**
- **Acids**
- **Nuts, fruits**
- **Other ingredients** – antioxidants, waxes etc.



Sugar-based confectionery



BASIC INGREDIENTS OF CONFECTIONERY - SWEETENERS

Carbohydrate-based sweeteners:

- Sucrose, Glucose syrup, Fructose, High Fructose Corn Syrups (HFCS)

Polyol sweeteners

- Xylitol, Maltitol, Erythritol, Mannitol, Sorbitol

High Intensity Sweeteners

- Saccharin, Aspartame, Acesulfame K, Sucralose



Sugar-based confectionery



BASIC INGREDIENTS OF CONFECTIONERY - HYDROCOLLOIDS

- Gelling agents, thickeners and stabilizers

Starches

- main ingredients for glucose production
- main raw materials (e.g. starch jelly)
- mold making
- surface treatment by dusting

Modified Starches

- for a specific application or stability improvement



Sugar-based confectionery



BASIC INGREDIENTS OF CONFECTIONERY - HYDROCOLLOIDS

- Gelling agents, thickeners and stabilizers

Pectin

- obtained mainly from apple or citrus fruits
- fruit jellies or Turkish delight

Gelatin

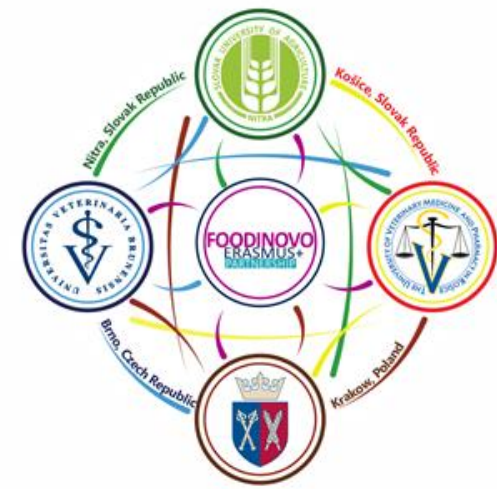
- from animal origin byproducts (cattle and pigs)

Gums

- agar, arabic gum, carrageenan



Sugar-based confectionery



BASIC INGREDIENTS OF CONFECTIONERY - PROTEINS

Milk protein (whey proteins and caseins)

- nutritive value, flavour and colour (Maillard browning and caramelization)
- caramel, fudge and toffee

Egg albumin

- whipping and foaming agents

Soy protein

- whipping and foaming agents
- nougat



Sugar-based confectionery



BASIC INGREDIENTS OF CONFECTIONERY

FATS

- ❖ Cocoa butter
- ❖ Coconut oil
- ❖ Palm kernel



EMULSIFIERS:

- ❖ Lecithin
- ❖ Glycerol monostearate



Sugar-based confectionery



BASIC INGREDIENTS OF CONFECTIONERY

COLOURING AGENTS

- natural (caramel, anthocyanins, annatto)
- approved synthetic substances (Tartrazine, Sunset Yellow FCF)

FLAVOURING AGENTS

- natural (pieces of vanilla pod)
- synthetic substances
- essential oils



Sugar-based confectionery



BASIC INGREDIENTS OF CONFECTIONERY

ACIDS

- ❖ Citric acid,
- ❖ Tartaric acid
- ❖ Malic acid



NUTS

- ❖ Almonds, Brazil nuts, Cashew nuts, Hazelnut, Peanuts



FRUITS

- ❖ Fresh fruits, Preserved Fruits, Jams, Dried Fruits



Sugar-based confectionery



BASIC INGREDIENTS OF CONFECTIONERY

ANTIOXIDANTS

- protect against lipid oxidation

- **synthetic** (butylated hydroxyanisole, butylated hydroxytoluene)
- **natural** (tocopherols)

WAXES

- ❖ Beeswax
- ❖ Carnauba Wax
- ❖ Candelilla Wax



Non-Crystalline Candies

Hard Candy
Caramel – Toffee
Gummies
Jellies



Hard candy

- also referred to as „high boilings“ or „boiled sweets“
- hard, chewy, homogenous and non-crystalline nature

The process of making:

- ❖ Sugar is dissolved and glucose syrup added
 - sucrose + glucose syrup (3:2) boiled down to about 98% of solids
- ❖ The mixture is boiled to the required temperature (about 150 °C)
- ❖ Cooling the boiled mass
- ❖ Adding flavour, colour and acid
- ❖ Shaping the product
- ❖ Wrapping



Hard candy

Defects:

- ❖ appearance – colour, shape
- ❖ eating quality – flavour, texture

- Stickiness
- Graining
- Flavour loss



Caramel and Toffee

- chewy candies, distinguished by the addition of milk or its components

Difference between Caramel and Toffee:

❖ Toffee:

- higher boiling temperature than Caramel
- lower amount of dairy ingredients and fat than Caramel
- harder than Caramel
- darker in color than Caramel

The process of making:

- Mixing and Emulsification
- Cooking and Browning
- Cooling
- Forming



Caramel and Toffee

Defects:

- Cold flow
- Graining
- Stickiness
- Hardness
- Oil separation
- Sugar and protein graining



Gummies and Jellies

- ❖ Gummies – candies made with gelatin
- ❖ Jellies – candies made with other hydrocolloids (starch, pectin)

The process of making:

- Mixing
- Dissolving
- Heating and Cooking
- Forming
- Curing
- Finishing



Gummies and Jellies

Defects:

- ❖ formulation issues
 - ❖ processing problems
 - ❖ storage conditions
-
- Too hard or too soft
 - Sticky
 - Deformed
 - Graining



Crystalline Candies



Fondant
Caramel – Fudge
Compressed Tablets



Fondant

- semi-solid to solid consistency of sugar mass with a fine crystalline structure
- used to crystallize the caramel-type base of fudge

The process of making:

- ❖ preparation of sugar syrup
 - sucrose + glucose syrup (4:1) boiled down to about 88% of solids
- ❖ mixture is boiled to required temperature (about 117 °C)
- ❖ boiled mixture is cooled with a high degree of agitation



Fondant

Factors affecting fondant quality:

- ❖ temperature
- ❖ speed of agitation
- ❖ retardation of crystallization
- ❖ sucrose to glucose ratio
- ❖ moisture content

Defects:

- Too hard or too soft
- Sticky
- Gritty or grainy texture
- White surface discoloration



Caramel - fudge

Fudge

- grained caramel-like candy
- varieties range in their degree of texture and moistness

Difference between Fudge, Caramel and Toffee:

❖ Fudge:

- contains more sugar and milk than toffee or caramel



Factors affecting final flavour and texture of fudge:

- boiling of caramel base
- amount of fondant added
- proportion of sucrose to glucose



Caramel - fudge

The process of making:

- ❖ Mixing and Emulsification
- ❖ Cooking and Browning
- ❖ Add fondant /grain 
- ❖ Cooling
- ❖ Forming 

Defects:

- Cold flow
- Stickiness
- Hardness
- Oil separation
- Sugar and protein graining



Compressed Tablets

- candies produced by application of high pressure processing
- sucrose, dextrose

The process of making:

- ❖ Ingredient preparation
 - Wet granulation
 - Slugging (Dry granulation)
- ❖ Powder conveyance
- ❖ Compression

Defects:

- Sticking
- Capping
- Scoring
- Variations in size or shape



Other Candies



Nougat
Marshmallow
Marzipan
Panned and Licorice Confections



AERATED CANDIES

Nougat and Marshmallow

Methods of aeration in candies:

- ❖ mechanical - pulling
- ❖ chemical - sodium bicarbonate
- ❖ adding a frappé

The process of making:

- Dissolving and cooking
- Stabilizer addition
- Cooling
- Aeration
- Final ingredients addition



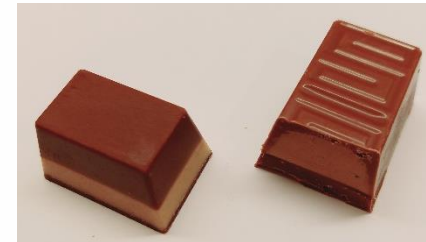
AERATED CANDIES

Nougat

- ❖ fondant with a whipping agent (a frappé)
- ❖ aerating agents – egg albumen
- ❖ fat is added to decrease stickiness

Defects:

- Improper density
- Product too hard
- Product too sticky
- Cold flow
- Graining during storage



AERATED CANDIES

Marshmallow

- ❖ formed by air bubbles surrounded by sugar syrup
- ❖ Foam stabilizers:
 - gelatin, egg albumen, agar, pectin, milk or soy protein

Defects:

- Improper density
- Product too hard
- Product too sticky
- Graining during storage
- Mold growth
- Problems in starch deposited marshmallow
- Cold flow



OTHER CANDIES

Marzipan

- ❖ mixture of ground blanched almonds and sugar (ratio 1:1)

The process of making of basic marzipan mass:

- crushing of peeled almonds and mixing with sugar
- rolling - refining (larger almond particles)
- roasting - evaporation of water

Defects:

- hardening
- dehydrating
- rancidity



OTHER CANDIES

Panned confections

- have a thin layer or shell that is applied at the candy's center

The process of making:

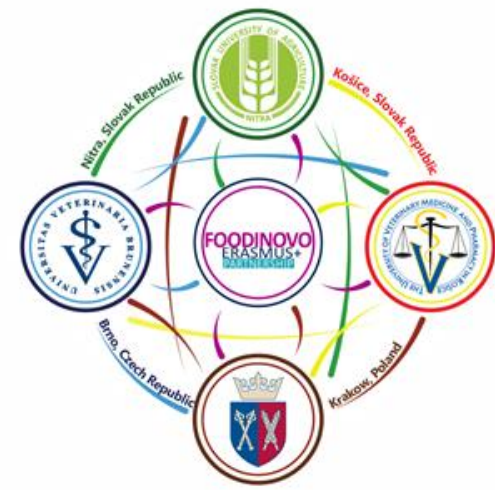
- ❖ Sugar shell application
- ❖ Polishing and Glazing
- ❖ Special decorations

Licorice confections

- contain licorice root extract (glycirrhizin)

The process of making:

- ❖ process involves mixing and cooking, forming the candy, cutting and packaging
- ❖ represents one of the oldest forms of candy



Sugar-based confectionery



FACTORS AFFECTING SENSORY PROPERTIES AND QUALITY:

- raw materials (sucrose)
- properties of sugar solutions during evaporation
- chemical reactions during evaporation
- crystallization of sucrose
- hygroscopicity of individual raw materials and finished products
- sweetness of individual raw materials



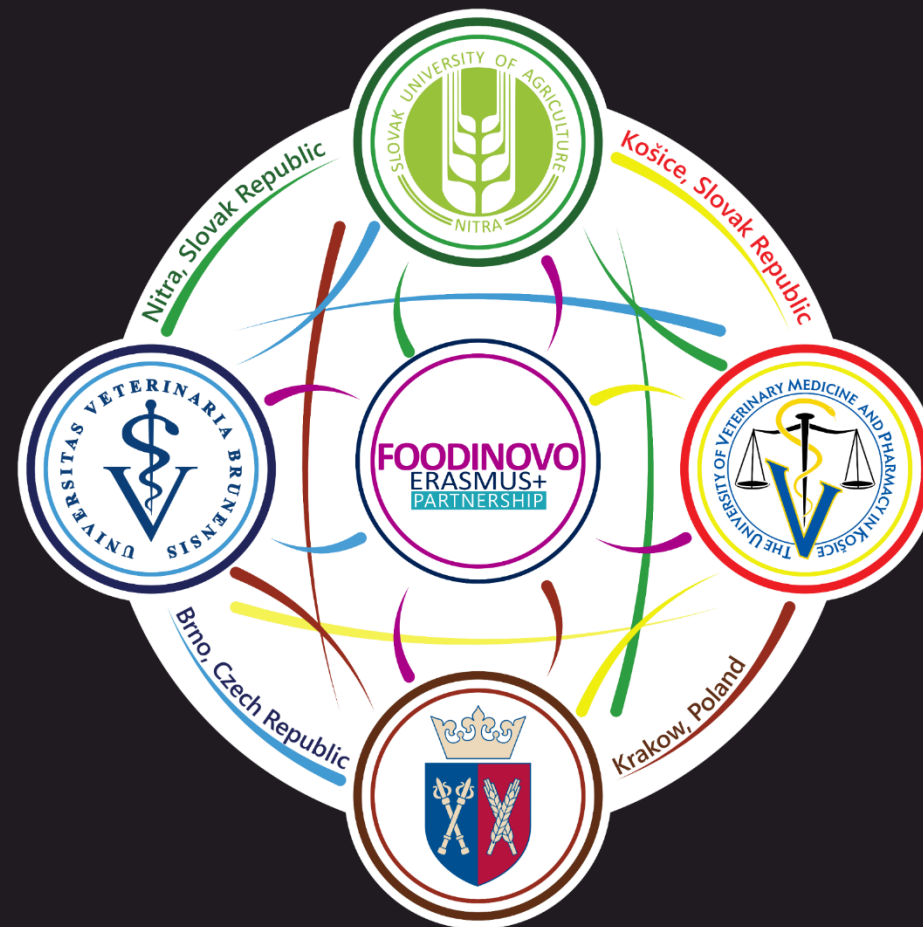
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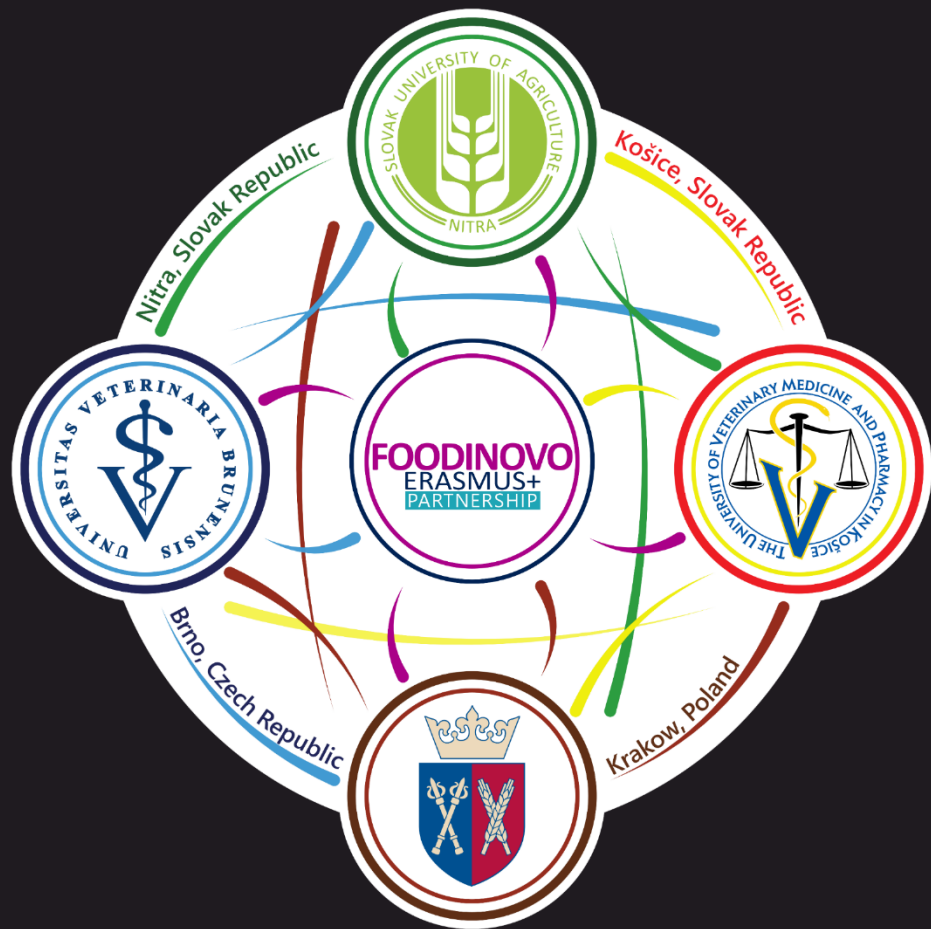
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