



## Chocolate Science Short Course (Summer 2024)

### Audience

Owners of Bean/Farm to bar Companies  
Employees that are new in the Bean/Farm to bar Companies  
Startup chocolate companies  
Manufacturers of chocolate products  
General public for personal interest

### Course Structure

4 days: 8:00 am – 4:30-5:00 pm  
Combination of presentations, discussions and hands on

### Learning Outcomes

- Learn about the different cocoa beans commercialized in the world
- Display a basic understanding of the factors that lead to a successful fermentation
- Familiarization with all the steps in bean/farm-to-bar as well as Dutch processing
- Learn an appreciation for the basic flavours, compounds and notes present in the cocoa bean after fermentation and after roasting and conching
- Describe allowed ingredients in the four chocolate bars products regulated by Canadian laws
- Display a basic understanding of the factors affecting the structure, the texture in chocolate bars
- Appreciate the changes in the chocolate structure when cocoa butter is replaced by other fats or when cane sugar is replaced by other sweeteners
- Name health benefits of chocolate
- Be aware of safety regulations in the manufacture and packaging of chocolate

**Developed by** Dr. Fernanda Peyronel

## **Program**

### **Day 1 - How fermentation and roasting go hand in hand**

#### Presentations

The cycle of a cacao bean from the plant to a chocolate liquor

Changes in the cacao bean during fermentation and roasting

#### Hands on

Use a convection oven to roast beans

Breaking and Winnowing

### **Day 2 How much is too much grinding?**

#### Presentations

Changes during grinding, refining and conching

Chocolates standard of identities in Canada

The role of ingredients: sugar, fat, emulsifier, cocoa powder

Recipes in the four chocolate categories

#### Hands on

Grinding of beans using Bench Top Melangers

### **Day 3 Nutritional aspects of nibs and chocolate bars**

#### Presentations

Nutrients in nibs

Fat replacement: is this a good thing or a bad one?

Cane Sugar replacement: changes in the final product

Methods to carry out tempering and why is it needed

#### Hands on

Discussion of the recipe to use based on the chocolate to make.

Add ingredients according to the recipe using the Melanger

## **Day 4 Tour of Facility and Chocolate tasting**

### Presentation

The crystalline structure of a chocolate bar and analytical techniques used to study this.

How to be free of contaminants: General Manufacture Practices (GMP) at farm level and at industry level.

### Hands on

Demold bars

Testing of the chocolate bars made as well as some commercial ones.

Visit and to the Microscopy facility at the Science Complex and to some of the Food Science Labs.

Invited speaker to wrap up the presentation: Perspective of a cacao bean importer